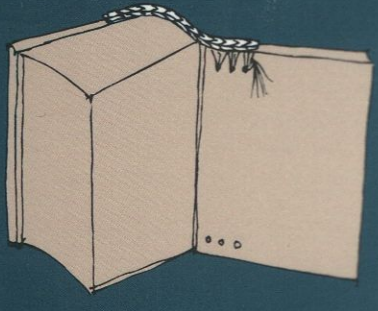
ENDBANDS
FROM EAST TO WEST
HOW TO WORK THEM

JANE GREENFIELD & JENNY HILLE



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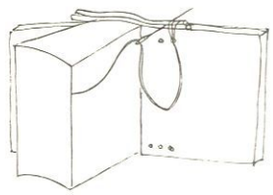
Jane Greenfield & Jenny Hille

Third Edition of *Headbands: How to Work Them*

Revised by Jenny Hille



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Foreword

In my mind, knowledge is like a building in which the foundations are followed by a ground floor, then a first floor, a second one, and so on. Since it was first published in 1986, Jane Greenfield and Jenny Hille's book on endbands has been for me and most, if not all, book conservators and bookbinders the foundation of our knowledge of endbands, of how to distinguish them and of how to make them. I still cherish my first copy of the book, clumsily bound by myself with a beige book cloth when I was graduating from my BA in Conservation, back in the early 90's. *Headbands: How to Work Them* – as the book was originally titled – certainly guided me through the different processes of endband-making and has established my conviction that manual skills and processes are communicated in print effectively primarily with drawings, something which I have adopted as standard practice ever since. Needless to say, I was thrilled when Sylvie Merian asked me if I would like to meet Jenny, as she is one of the persons behind the names with which I have spent quite some – often arduous – time. We spent a few happy hours at Sylvie's flat discussing – what else? – endbands, and I left with a copy of the French translation of the book.

What for me had started as an intriguing puzzle of how certain endbands are made, has become almost an obsession through the years and through many historic bindings seen on the way. In 2007 I first published a paper in *The Paper Conservator* where I attempted to create a hierarchy and a categorization of endbands found in Greek-style bindings. My proposed taxonomy was based on their structural features, a categorization and terminology which I have revised since then, aspiring to organize everything in a logical and consistent way. I say "everything" because there is a lot; my research is revealing bit by bit the great complexity and huge variation that endbands present – in materials, techniques, structures and the many combinations in-between – much greater than people interested in the history and technique of bookbinding had ever suspected. It is now more than clear to me that endbands have a two-fold interest beyond the mere pleasure of replicating them in the context of book conservation or bookbinding: firstly they can be used as a major source of information for the identification, dating and categorization of bindings, and secondly they can be considered in parallel to fabric-making techniques, a comparison which is extremely informative for endbands themselves certainly, but also for the material culture of the book in general. The basic distinction between endbands found in Western bindings and those found in Eastern bindings, which appears in this third edition of the book is both helpful and meaningful, and certainly indicative of the realization that endbands, like all artifacts, present variations according to the time, place and cultural context in which they were made. The use of terms like Armenian, Greek, Coptic, Islamic etc. is clearly a proof of this fact, although at times they can be in a way misleading as they imply a distinct provenance, which is often far from the truth. Having said that, it is difficult to avoid designating, for example, a type of endband with the epithet 'Greek' when it is indeed found in most of the Greek

manuscripts bound until the late 17th century. The fact that such a 'Greek' endband can be found in the binding of a Syriac or Arabic manuscript can give rise to further inquiry and often create an intriguing bookish coexistence of different ethnicities, cultures and religions. There is no harm in this, as long as we remain aware that all sort of complexities lie behind such small things as endbands.

This book will certainly keep older but especially younger conservators and bookbinders busy and happy providing the basis for their quest to discover and understand endbands, much as it did for me for many years. The fact that Greenfield and Hille's book is still in print 30 years after it was first published presents good proof of its value, as the small but important changes that Jenny did in this third edition confirm her interest and stamina in pursuing her research. Needless to say, I am honored to have been asked by Jenny to write this foreword, and I should use this opportunity to thank her, and Jane, for sharing with all of us their work and knowledge. Their book has been, and still is, a sort of Ariadne's clew that helps us find our way out from the maze of endbands.

— Georgios Boudalis
Thessaloniki

Preface to the Third Edition (2017)

This little manual of endbanding instructions has now been used by binders and conservators for thirty years. It is time to update and make a few changes to the manual so that it can continue to serve our community for many more years. In this new edition, except in the earlier prefaces written by Jane Greenfield, I am replacing the word headband with the contemporary and less confusing term endband used by most scholars, conservators and binders. A lot of new information about endbands has surfaced over the years and some superb research on bookbinding structures, in particular by J.A. Szirmai, has been published since the first edition of our book, adding to the work of pioneers in the field such as Paul Adam, Theodore Petersen, Berthe van Regemorter, Karl Jäckel and others.

The endbands in the manual have been regrouped based on their regional provenance, beginning with all the endbands from the Eastern Mediterranean, followed by those found in books from Western Europe. I have also completely reworked the instructions for the Armenian endband based on extensive research with Sylvie Merian, a scholar of Armenian book history. We examined together many Armenian bindings in New York libraries in order to create a more accurate description of their endbands. Maria Fredericks and Frank Trujillo of the Thaw Conservation Center, The Morgan Library & Museum, and Mary Oey, now at the Library of Congress, helped us test and improve the instructions for an article (Hille & Merian, 2011) and I wish to thank them here. The Armenian and the Italian Renaissance endbands with their many cores are the most difficult of all those described in the book. I never imagined in the early eighties that the beautiful Italian Renaissance and Greek endbands which I discovered on models stored away in a cabinet at the Istituto Centrale di Patologia del Libro in Rome and that I begged one of their conservators to teach me would lead to the creation of this manual with Jane, and that the obsession would be so long lasting and gratifying.

I wish to thank Oak Knoll for their many years of warm and ongoing support, The Morgan Library & Museum for the Armenian endband photograph used on the cover, as well as my friends and fellow conservators Judith Reed and Jerilyn Davis and scholars Sylvie Merian and Georgios Boudalis in particular for their generous help, advice and encouragement for this updated and revised edition which I am dedicating to the late Jane Greenfield (1916-2008).

Preface to the First Edition (1986)

Headbands are fascinating, both from the point of view of their history and of their construction. Most instructions on how to work them are sparse.

Twelve headbands are described in this book, with step-by-step drawings. We

hope that this will prove of interest to beginners and experienced binders alike.

The number of variants is so great that it would be impossible to identify and describe them all. Only the major types have been described, and only one way of doing each presented. We haven't suggested the suitability of these headbands for specific uses or tried to evaluate their mechanical value. These judgments are up to the binder.

Jenny Hille learned some of the more unusual headbands abroad, and figured out ways of doing others. We have worked out the descriptions together. Neither one of us could have produced this book without the other.

We would like to thank Louise Carter for trying out these instructions (successfully) and for many suggestions that have made for greater clarity, Gisela Noack for giving us very helpful advice, and Jerilyn Davis for seeing this book through the press.

Preface to the Second Edition (1990)

There is usually more than one way to work a headband, obviously some better than others. Jenny Hille has given several workshops on headbanding since the book was first published and, for her students, worked out an easier way to embroider a French headband. This is the method described here, and is the main revision in this second edition of *Headbands*.

Two chapters have been added, a Monastic headband and the Renaissance chevron headband, as well as some information on cores.

Publishing the first edition ourselves has been a great pleasure for Jenny and me, for it put us in touch with bookbinders all over the world. Although it seems vain to say so, I think *Headbands* is a classic manual that will prove useful for bookbinders today and in the future.

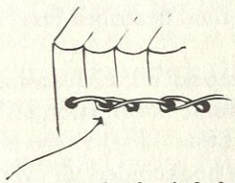
We are proud that Oak Knoll Books is publishing this second edition.

Early endbands were often made up of secondary embroidery or weaving, not tied down, worked on a primary endband itself tied down and laced into wooden boards. They served to consolidate the head and tail of the spine and strengthen the board attachment. It has been recently claimed that most of the more elaborate endbands of the Eastern Mediterranean bookbinding traditions, like the Armenian, or the 'woven' Byzantine endbands should in fact more precisely be described as twined endbands, as there is a clear distinction between weaving and twining.[1]

Endbands gradually declined to a nineteenth century example consisting of a piece of paper neatly painted with pink stripes and pasted around a bit of string, and to today's machine-made ones available by the yard.

A few suggestions are collected here:

A good, hand worked endband should be tied down in the center of the gatherings which may be marked with strips of paper (acid-free in case one is left in the book by mistake). It is generally considered a good thing to tie down at the kettle stitch. However, Bernard Middleton says that it seems that no weakness has resulted when this has not been done *(English Craft Bookbinding Technique,* p. 107).



Come out on this side of the kettle stitch chain.

Knowing when and where tension on threads is needed comes with practice. Equal tension on the threads when they are on opposite sides of the core is important in maintaining an even row of beads as well as in the general appearance of the endband, and keeping the threads parallel to the bookblock is equally important.

Endbands should be tightly worked and the thread pushed back against its neighbor with the needle as you go along, so that there is no gap between threads.

Cores

Tawed skin, leather, hemp or linen cord, vellum, cane, rolled paper, and wood have all been used as cores at one time or another. Cores can range from about 1/16″ to 1/4″ in diameter. They are, of course, mostly round, although tall, flat ones became popular in the early nineteenth century. They are also common among some very elaborate twined endbands in XIVth – XVth century Byzantium.

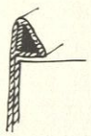
The maximum number of cores we have found in a single endband is five – in the Italian Renaissance endband. However up to seven cores are not uncommon in some elaborate Byzantine twined endbands: one flat vertical primary core and six cores placed in the front and worked in a way similar to the Armenian endband.

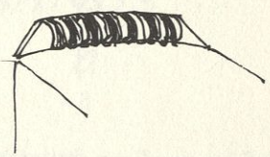
Endbands are easiest to work if the cores are moderately stiff. They can be coated with an adhesive and allowed to dry.

The embroidery of endbands on cores that are not laced into the boards should begin and end two or three gatherings in from the edges of the spine. See p. 46.

Another approach to preparing and attaching a core is thought to have been taught by Ignatz Wiemeler.[2]

Glue a strip of vellum the height of a core to a strip of leather of the same height. When they are dry the core can be cut in a triangular shape. Glue thin Japanese tissue around the core and glue the core to the spine of the book. Having the core held in place makes endbanding much easier, particularly for beginners.





Thread

It is difficult to specify the length of thread needed as that depends on the size of the core, the width of the spine, and the number of tie-downs if any. In *Bookbinding & Conservation by Hand* (pp. 107–10), Laura Young has given the following guidelines: single 1/16″ core, book 1″ thick, 2 colors, 10″ of winding thread, 18″ of tying down thread. Double endband, larger cores, 2 colors, 15″ and 27″; German style, 1/16″ core, 2 colors, 12″ of each. We have found that in general much less thread than one supposes is needed and is easier to work with.

More thread can easily be added by tying the additional thread to the existing thread around a kettle stitch. Thread can also be tied to the sewing thread inside a gathering before going out onto the spine. Use a weaver's or square knot. It is, of course, best to have enough thread to finish the endband without adding.

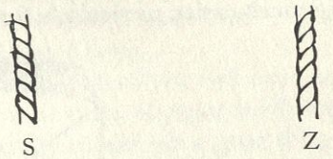
A different color of thread can be laid along the spine side of the core and included in the embroidering until you are ready to use it. The original color can be treated in the same way until needed again.

Thread can best be flattened for threading into a needle by licking it and pressing it down on a hard surface with your thumbnail rather than between a thumb and fingernail only.

[1] Boudalis, Georgios: *Twined Endbands in the Bookbinding Traditions of the Eastern Mediterranean,* Horn Conference (Horn, Austria, 2014)

[2] Influential German bookbinder and teacher (1895-1952). He was the teacher of several German binders who in turn trained a number of American binders.

In the course of winding, thread often untwists and so thickens. It can be twisted back in the direction of its twist - S or Z - and held to maintain its original thickness while winding.



It is helpful to wax linen thread with beeswax to help prevent untwisting and cut down on knotting, but silk thread should not be waxed as this dulls the sheen.

Bookbinding supply houses carry linen thread of various gauges. Embroidery stores carry a wide range of colored silk and cotton thread. Most supplies are also available online.

The materials suggested here are the ones we have used and which are readily available. In some cases they are a way of communicating a specific size. They are suggestions only and obviously one can deviate from them.

Needles

Crewel Nos. 7 and 8 needles are very fine. Crewel No. 6 has a large eye and is good for general work. Tapestry Nos. 18 to 22 needles are best for leather thongs as their eyes are very large. Curved needles come in sets of upholstery needles, but many commercially available curved needles are too thick for endbanding and have a semi-circular shape that is difficult to hold. A better option is to use whatever size needle you feel is the best for the particular endband you are making and gently bend its tip with small pliers after heating it with a match.

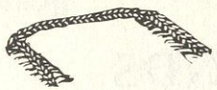
Equipment

Finishing press
Scissors and awls
Needle nose pliers
Hemostats (locking scissor clamp) with curved or straight tips
Drill and drill bits

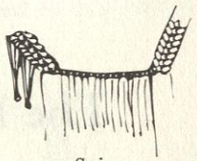
The ENDBANDS

1. Coptic Endband

The instructions for this endband have been worked out from Theodore Petersen's "Drawing of the Usual Plain Coptic Headband Sewing" in *Ars Orientalis* 1 (1954) p. 55. The endband was sewn on a book with wooden boards and a spine lining. The lining has been left out of the drawings here. For further details on the Coptic endband see Petersen 1954, Regemorter 1992, Szirmai 1999.

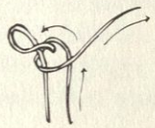


Edge



Spine

Although the following instructions seem complicated, the endband consists simply of a chain stitch with each link catching up the previous one.

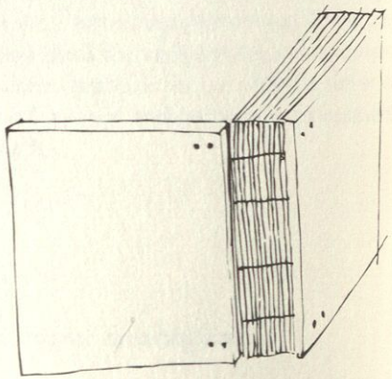


Materials

Barbour's 3 cord, No. 18 or No. 30 linen thread

Step 1

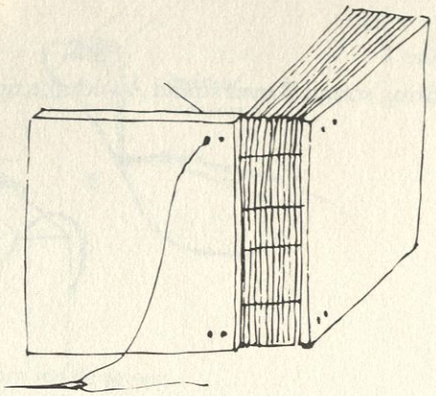
Bore four holes in each board, about 1/2″ in from the head and tail edges, 1/4″ apart, and about 1/4″ in from the spine edge.



Step 2

Go from inside to out through the outer hole of the back board, leaving an end inside the board.

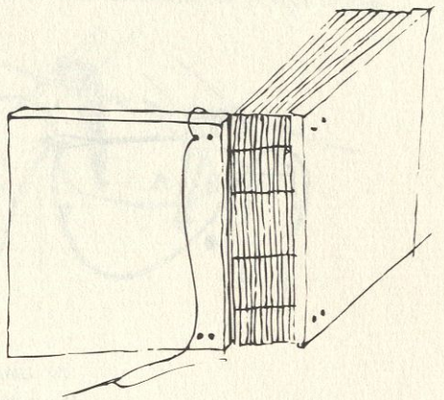
If you go over this end when looping around the board, it won't need further fastening.



Step 3

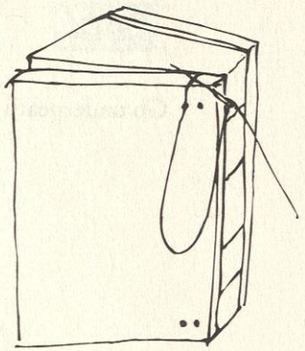
Loop the thread around the edge of the board and tighten it so that it is snug but not really tight.

(Do not pull the threads very tight throughout the sewing of this endband.)



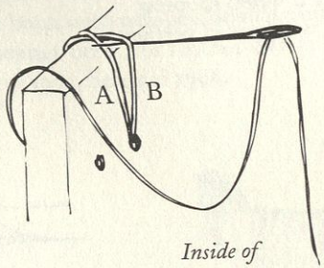
Step 4

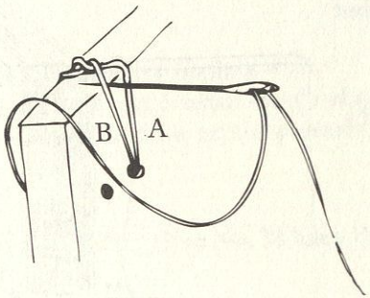
Go back up and through the loop, and then back through the first hole from inside to out.



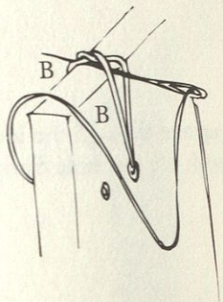
Step 5

Bring strand B over strand A with the tip of the needle.



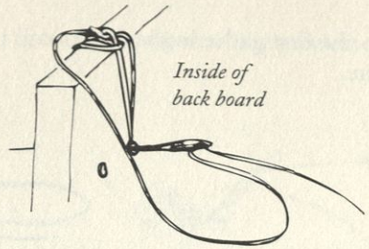


Go underneath both sides of B.



Step 6

Go into the hole from inside to out.

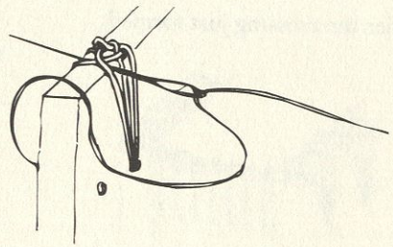


Step 7

Go under the latest thread crossing, also from inside to out.

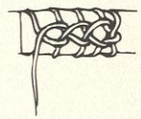
As is usually the case, the pattern is slightly irregular at the beginning.

Center the links on the edge of the board with your thumbnail as you go along.



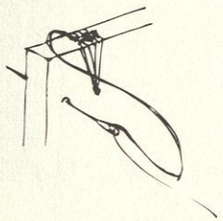
Step 8

Repeat steps 6 and 7 to the corner of the board. In this drawing the threads are spread apart to show the pattern clearly.



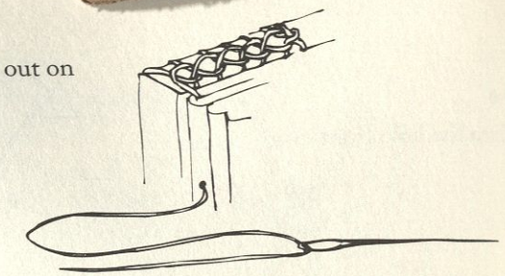
The endband actually looks more like the drawing on p. 10

Switch to the next hole to tie down when about half the distance between the holes is covered on the edge of the board.



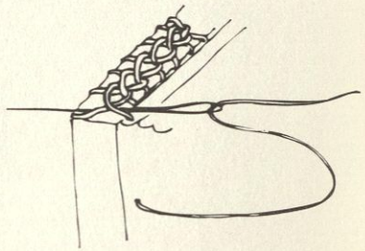
Step 9

Go into the first gathering and out on the spine.



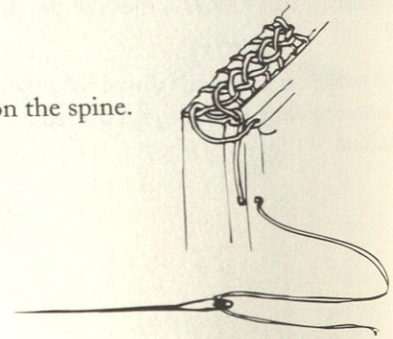
Step 10

Go under the crossing just formed.



Step 11

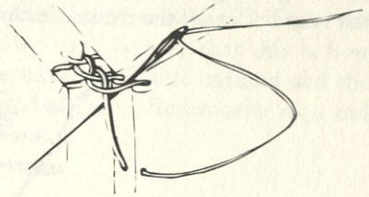
Go into the second gathering and out on the spine.



Step 12

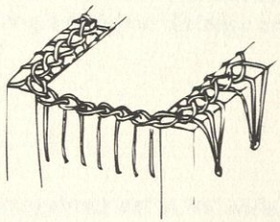
The thread going into the gathering and the outer tie-down of the previous one form a crossing.

Go under it and tighten gently.

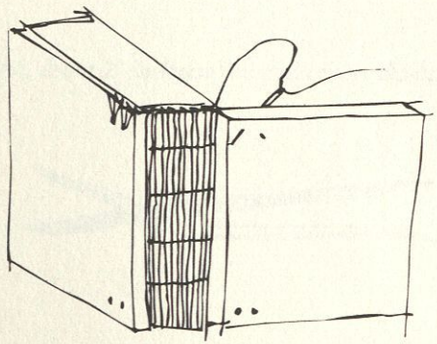


Step 13

Repeat steps 11 and 12 across the spine.

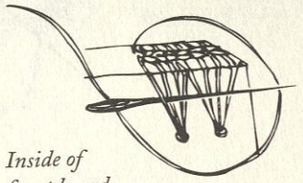


When you reach the front board go into the inner hole from inside to out and catch up the previous link as you have been doing.



Step 14

After repeating step 12 for the last time, tie a loop around the last tie-down inside the board. Cut off the thread, leaving about 1/2″, and glue the tail down.



Inside of front board

2. Ethiopian Endband

We have no source for these instructions other than examination of Ethiopian manuscripts in the Beinecke Library at Yale University. Very few of them have endbands, but those that do follow about the same pattern. Since, obviously, we can't take the books apart to see how they were put together, we can't be sure that this is how they were done. We have chosen what seems the most reasonable method and the resulting endband looks like the Ethiopian ones we have seen. Regemorter 1992 and Szirmai 1999 provide more details about this endband.

Spine

Edge

These endbands are made after the book has been covered. Two rows of stitches go through the leather on the spine, the thread attaching a braid on the edge of the book as it goes along.

Materials

2 strips of leather (strong, stiff, and thin if possible) about 1/8″ to 1/4″ wide by the width of the spine plus 4″ or 5″. For ease of reference we will assume that these strips are red and black.

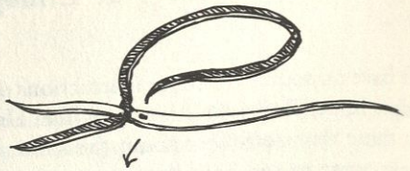
Barbour's 3 cord, No. 30 or No. 18 thread

Step 1

Pierce a hole with an awl, about 2″ in from the end of the black strip and lace the red one through it.

Step 2

Pierce a hole in the red strip and lace the black one through it.

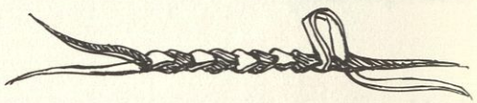


The holes should be about the width of the strips apart. It is easiest to pierce them after you have done the previous lacing.

Step 3

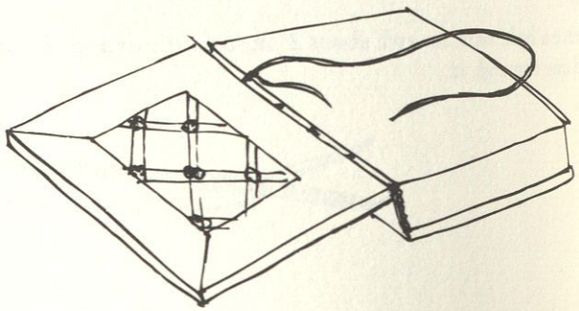
Continue lacing the strips together, alternating the one you lace, black into red, red into black.

This forms a braid like this:



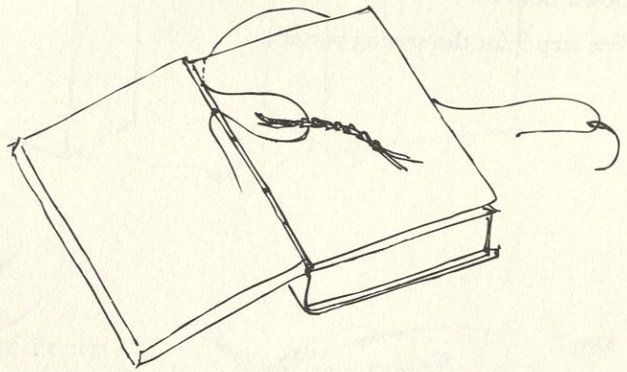
Step 4

Inside the hinge tie a piece of sewing thread about 1' long to the thread of the nearest sewing station. Use an overhand knot.

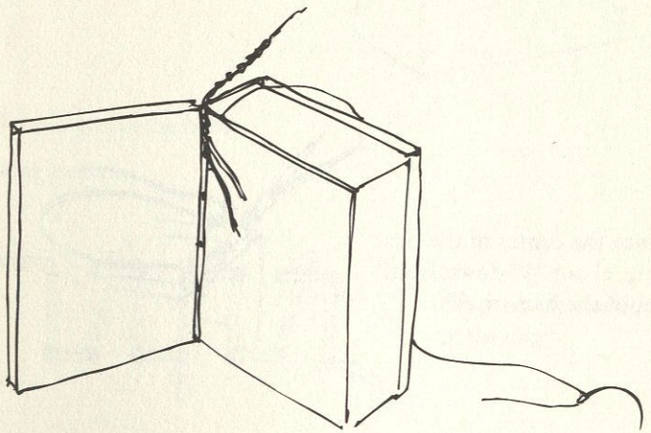


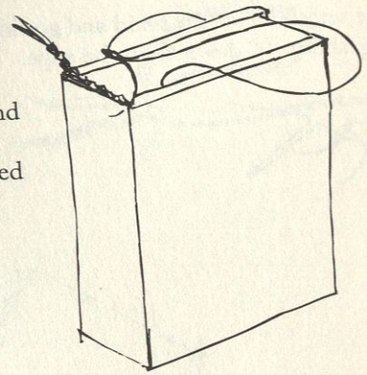
Step 5

Catch the underside of the braid and go sideways into the center of the first gathering, about ½" down from the edge.



Pull the thread tight. This brings the braid into position.

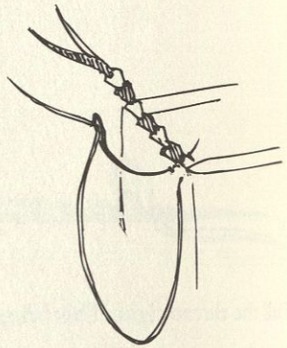




Step 6

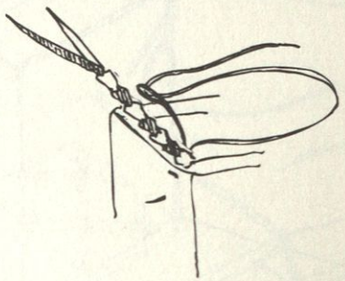
With the spine facing you, come up and out through the turn-in level with the edge of the bookblock or slightly angled down from it.

See step 9 for the sewing pattern.



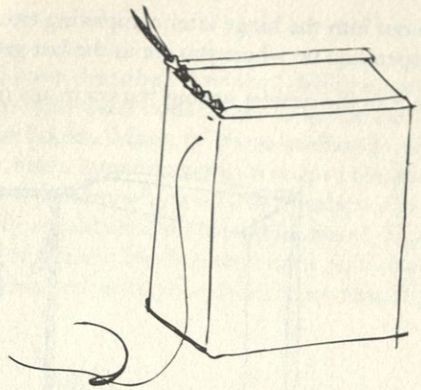
Step 7

Go back through the leather, between the two strips of the braid, forming the first stitch ...



... and into the center of the next gathering, about 1/2″ down from the level of the first stitch ...

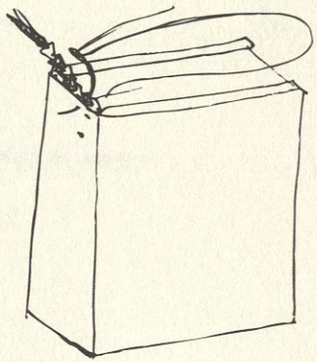
... and come out on the spine.



Step 8

Go back into the center of the next gathering, thus forming another small stitch.

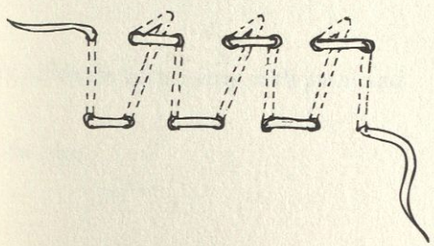
Go up to the edge, under the braid, and out through the spine leather.



Step 9

Repeat steps 7 and 8 across the book.

This is the sewing pattern.

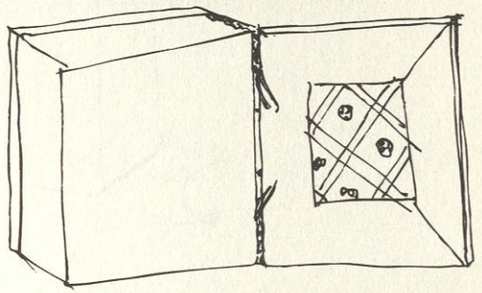


Start inside the first gathering.

Step 10

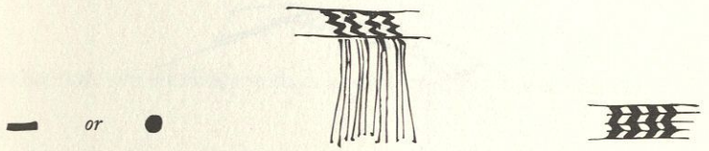
You can go out into the hinge after completing either the edge stitch or the one below it, depending on where you are in the last gathering.

Tie the braid to the nearest sewing station in any way you like.



3. Islamic Endband

Karl Jäckel and Deborah Evetts have described two very different methods of working this type of endband. We have seen both methods in the Beinecke Library's large collection of Islamic books. Many of these endbands were sewn without cores, a few on cord cores, and a larger number on strips of leather. There is very little variation in the chevron pattern which usually consists of two highly contrasting colors, with occasionally a gold or silver thread included. Scheper 2015 has carried out an extensive study of Islamic binding structures and describes the various chevron patterns that she observed in their endbands; see also Bosch and Petherbridge 1981, Fischer 1986.



Cross section *Spine* *Edge*

Materials

A strip of stiff leather, 1/4″ to 1/2″ wide by slightly longer than the width of the book
2 colors of silk or embroidery cotton thread
Barbour's 3 cord, No. 30 linen thread

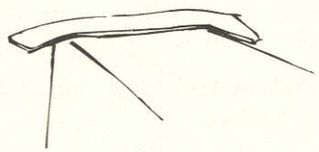
Step 1

Put the book in the press with the edge facing you.

Step 2

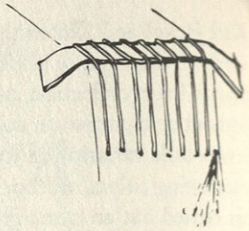
If necessary, stiffen the leather strip with paste and let it dry.

Glue it on the edge.



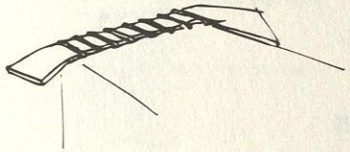
Step 3

Tie a thread to the sewing inside the first gathering with an overhand knot. Come out on the spine and loop the thread around the leather strip, going into the center of each gathering. Come out on the spine at the last one, cut off the thread, leaving about 1/2", fray it out, and glue it down.



The thread does not wind completely around the core itself but merely attaches it to the edge of the book.

Do not pull the thread too tight.



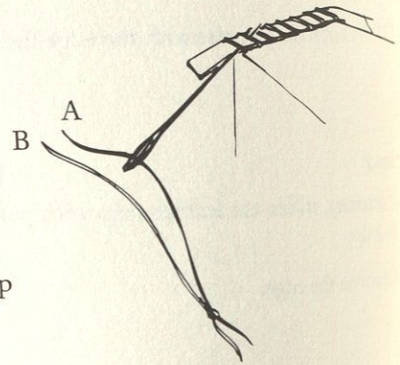
The threads in these drawings are very far apart for clarity. In fact, Islamic tie-downs are very close together and look like the drawing on the previous page.

Step 4

Tie two different colored threads together with an overhand knot. Come up through the leather strip with thread A, at the right of the second primary tie-down. This makes a nice size chevron.

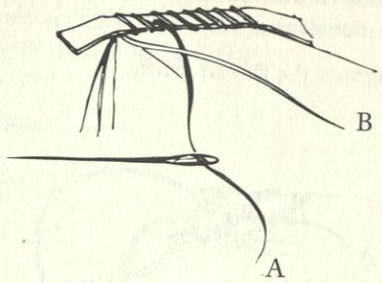
The size of the chevron can be varied by the number of tie-downs you go under. Ideally, the number of tie-downs should be divisible by the number you plan to go under.

Pull the knot snugly up under the strip of leather.



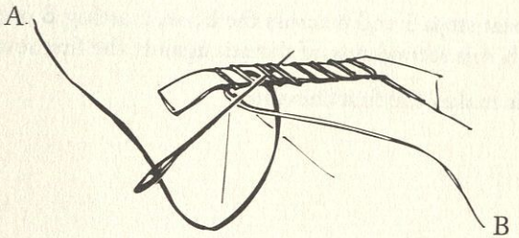
Step 5

Cross B over A from left to right.



Step 6

Go under the next two windings with A and tighten the thread gently.

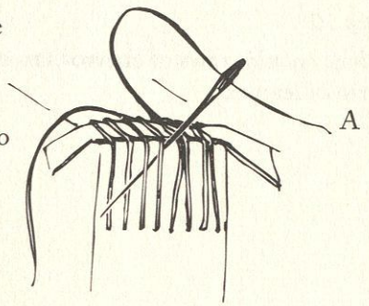


Step 7

Repeat steps 5 and 6 across the book with A, being careful to work along the front edge of the leather strip.

The easiest way to pick up a winding is on the spine. Then slide the needle and thread around to the front.

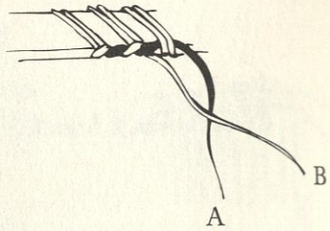
Note that picking up the threads pulls them together.

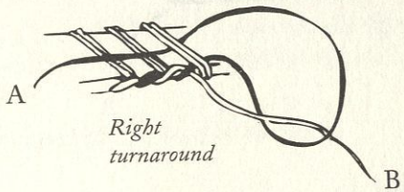


Step 8

Cross B over A and go back under the last two tie-downs with A.

Tighten the thread gently.

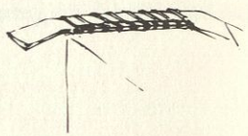


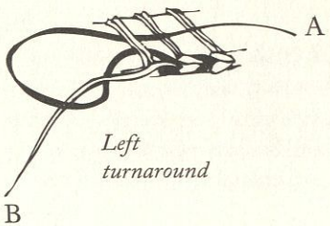


Step 9

Repeat steps 5 and 6 across the book, crossing B over A from right to left. Push this second row of threads against the first row.

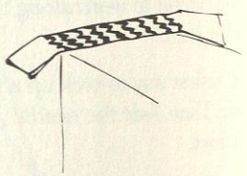
This makes the first chevron.





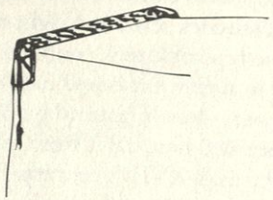
Step 10

Work enough rows of chevrons to cover your strip of leather.



Step 11

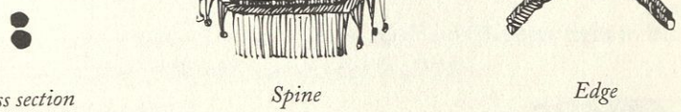
To finish, paste the ends of the core down on the first and last fly leaves. Cut off the embroidery threads, leaving about 1″, tie an overhand knot near the end of them to prevent fraying, and tack them, haphazard, to the core or spine lining.



The hinges of Islamic bindings usually cover the method of beginning and ending the endbands.

4. Greek Endband

Greek endbands are attached on the edges of thick, flush, usually grooved wooden boards, and are sewn through coarse cloth spine linings which, as usual, are not shown in the drawings. They often consist of one core with stitches sewn on a diagonal with another core with stitches sewn at a right angle to the edge of the book on top of it. Although only one type of Greek endband is described here – definitely the type most commonly used in Byzantine bookbindings – there seem to be many more variations, some of which were already noticed by Berthe van Regemorter. The earliest example of the type described here dates from the XIIth century and the latest examples are dated around the mid-XVIIth century. For more recent extensive research on the endbands found in Byzantine and post-Byzantine bindings, see Federici and Houlis 1988, Boudalis 2007, 2011, 2014.



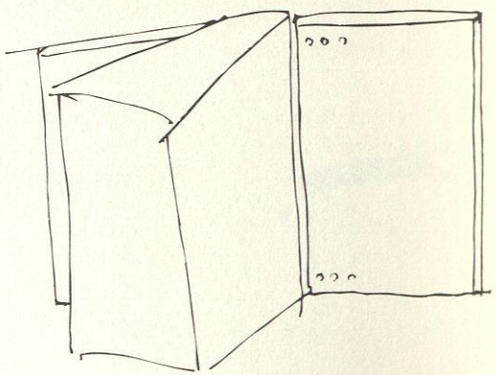
Cross section *Spine* *Edge*

Materials

1 stiff cord about 1/8″ to 1/4″ in diameter, depending on the size of the book, and about 4″ longer than its width
1 stiff cord, slightly thinner, and the same length as the first
Barbour's 3 cord, No. 18 linen thread

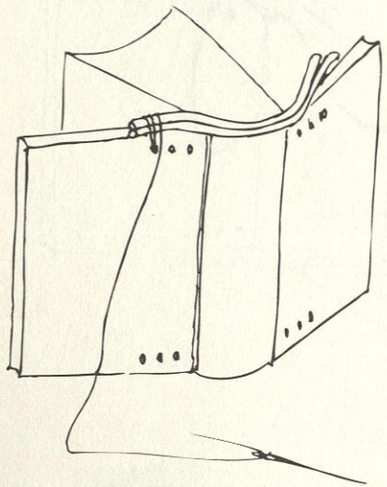
Step 1

Bore six holes in each board, 1/2″ in from the head and tail edges, about 1/4″ apart, and 1/4″ in from the spine edge.

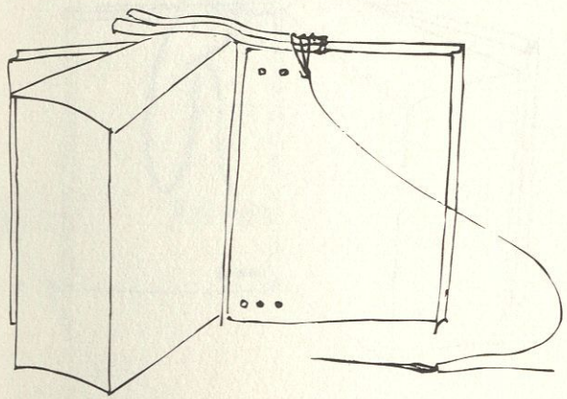


Step 2

Put the cores on the edge of the book with about 1 1/2″ extending onto each board. Starting from the outside, wind the thread three times into the outermost hole. If you go over the end of the thread when looping around the board, it won't need further fastening.

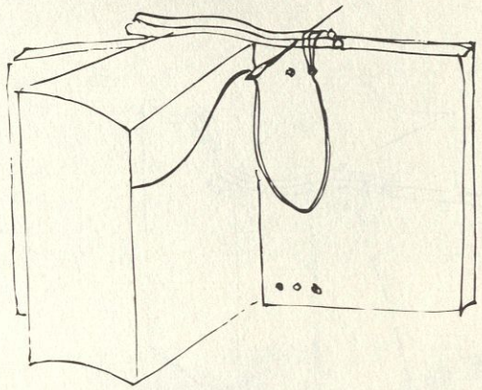


Go back through the hole to the inside.

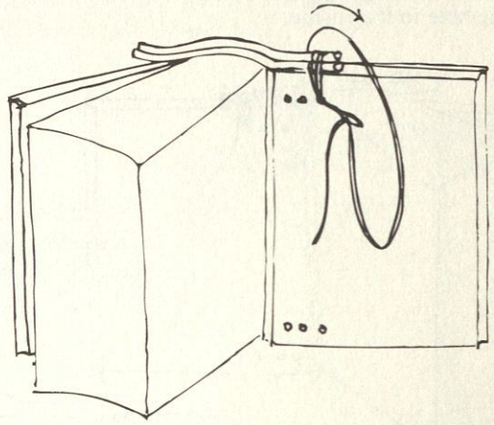


Step 3

Go between the cores from the inside out ...

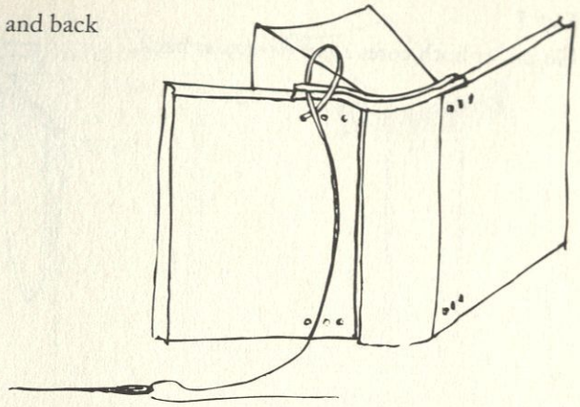


... over around both cores, down, and through the hole.

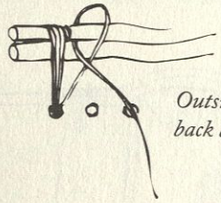


Step 4

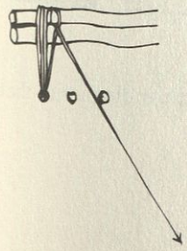
Go up around the upper core and back between the two cores.



This forms a loop.



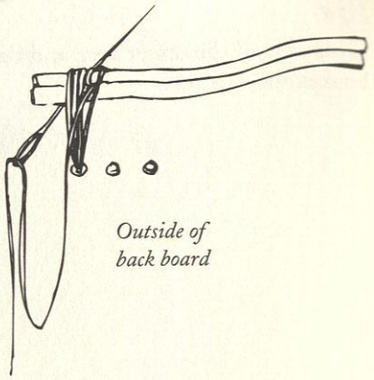
Outside of back board



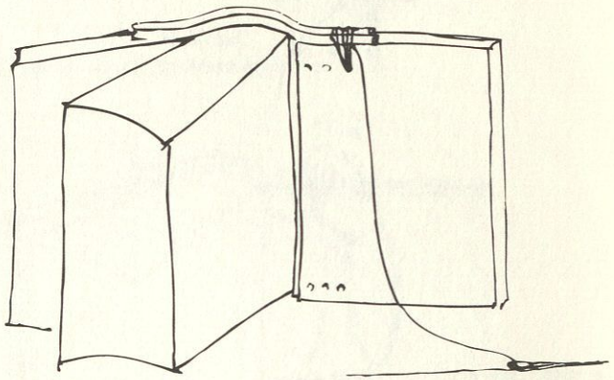
Pull tight.

Step 5

Go under both cores *three tie-downs* back.



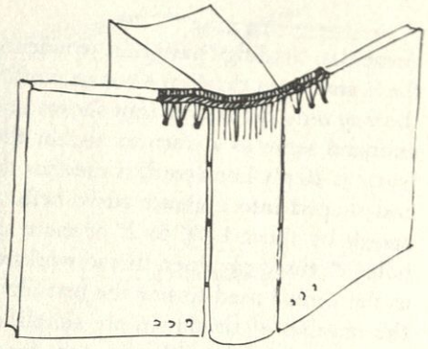
Outside of back board



Be careful to come out to the right of the first winding inside the board.

Step 6

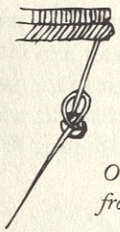
Repeat steps 3 through 5 across the book, moving on to tie down in the other holes in the board, then in the gatherings as you come to them and finally in the holes in the front board. End at the outer hole of the front board.



Step 7

Loop the thread around the final tie-down, cut it off, leaving about 1/2", and glue it down.

Cut the cores off flush with the beginning and end of the embroidery.



Outside of front board

5. Armenian Endband

Armenian bindings have thin wooden boards with primary endbands tied down to them and sewn through a coarse cloth spine lining that reaches about one-third of the way onto the boards (not shown in the drawings). The tie-downs of the primary endband serve as a warp to anchor the secondary embroidery. A fairly thick cord (such as 10 ply linen cord) is used for the primary core. It can be stiffened with paste and shaped into a gentle curve before it dries completely. The cord straddles the boards by about 1 1/2″ to 2″ or more and is anchored to the boards through several holes. A three-ply linen thread works well for the primary core and can be the same as the thread used to sew the text block. It goes through each section twice. (Note: the number of tie-downs are simplified in the illustrations). For a full description with photos of the different steps for the Armenian endband see Hille and Merian 2011. See also Merian 1993, 1998, Szirmai 1999, Kahn 2013.)

Cross section *Spine* *Edge*

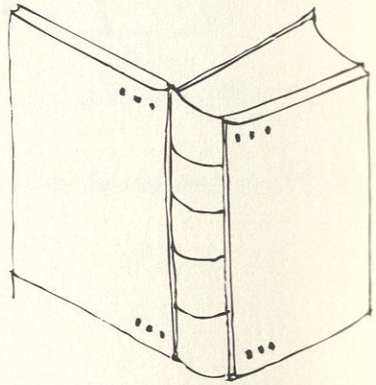
Materials

2 pieces of cord, about 1/8″ diameter, long enough to extend 2″ onto each board
2 pieces of cord about 1/16″ diameter and the same length
Barbour's 3 cord, No. 30 linen thread for the primary endband
3 colors of silk or cotton embroidery thread for the secondary endband (DMC thread or Metrosene Plus Cordonnet #30/3 or Gütermann 30wt)

Primary endband

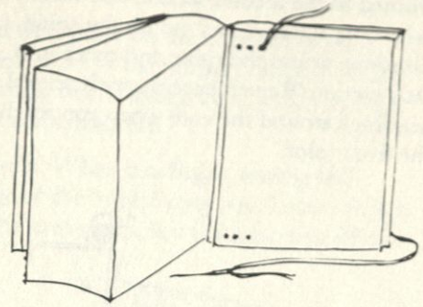
Step1

Drill three holes in each board, about 3/4″ to 1 1/4″ from the head and tail edges, the first one 1/4″ from the spine edge and the others about 1/4″ apart. The holes can be staggered or aligned.



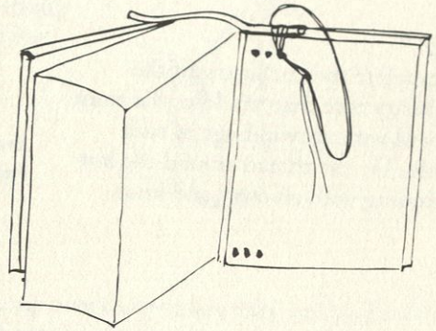
Step 2

Stand the book in front of you with the fore edge facing you and the back board open. Go through the outer hole in the back board from inside to out, leaving a tail inside.



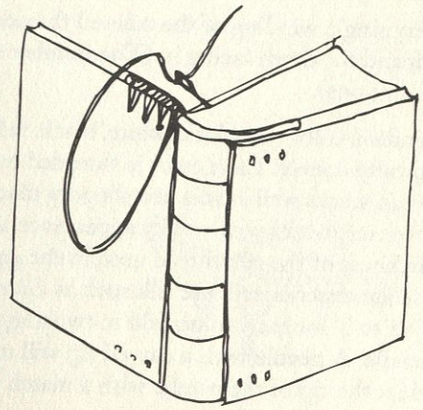
Step 3

Anchor the primary core with up to six windings in each hole working from inside to out. You can secure the tail in the first winding. As you reach the joint area going from the board to the spine, pack the core with a few windings.



Step 4

After winding across the joint, go into the first section at the first sewing station and come out on the spine. Repeat a second winding into that first section. Note that, except for the joint area, the thread does not make a full winding around the core itself. It only attaches it to the edge of the text block. The windings should be snug but not so tight as to flatten the core.

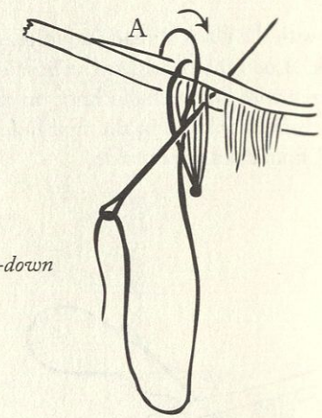


Step 3

With the fore edge still facing you, wind again over core A, from front to back (from inside to outside), this time angling the thread toward left. Skip five tie-downs and go under sixth tie-down in the back with the needle. Then go under core A and come out in front. Pull thread gently.

As you wind around the core, make sure the two strands lie side by side and are not on top of one another nor twisted. A small awl is useful to untwist the threads as needed. When you go under core A, avoid splicing through the fibers of the cores or the threads of the tie-downs with the needle. This applies throughout the windings of the other colors. It will make it possible to adjust the position of the endband on the edge of the text block when it is completed.

You might find it easier to catch and go under the tie-downs from the spine side. In that case, you will proceed from left to right but if the fore edge is facing you, you move from right to left. Pivot the book as needed to work comfortably.

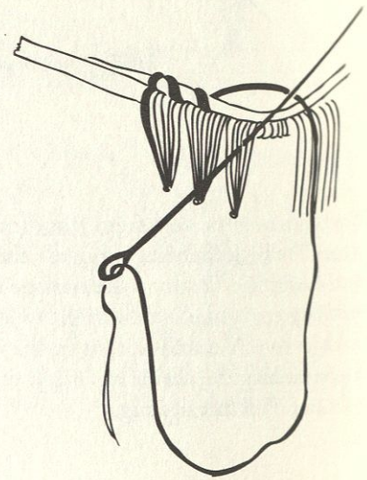


view from back, needle picking up tie-down

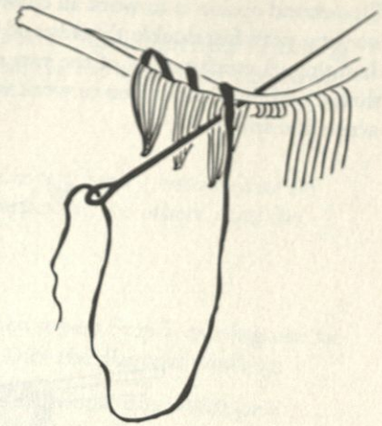
Step 4

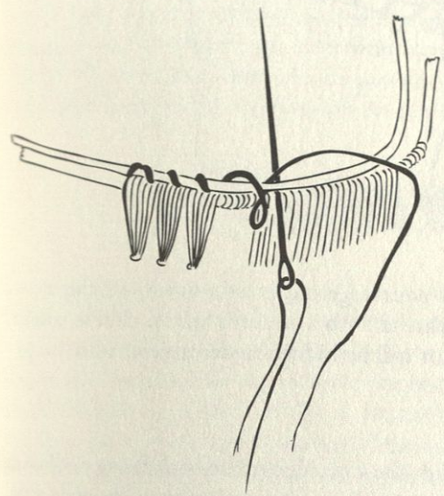
Repeat step 3. Skip the next five tie-downs and catch the sixth just before pushing the needle under core A.

Note that it is usually difficult to catch the tie-down and go under core A in one single step, so first go under the tie-down with the needle, pull the thread and then go under A.



The black thread is starting to form a diagonal pattern around core A and it is being anchored to every sixth tie-down of the primary.

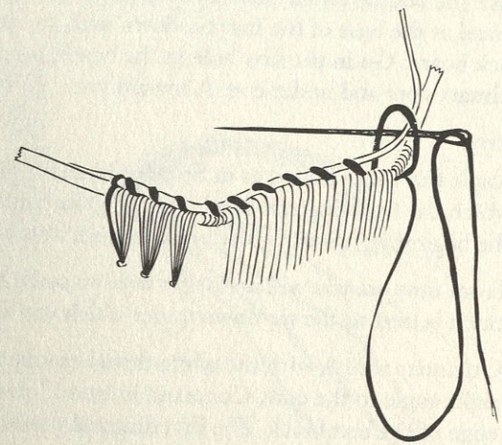




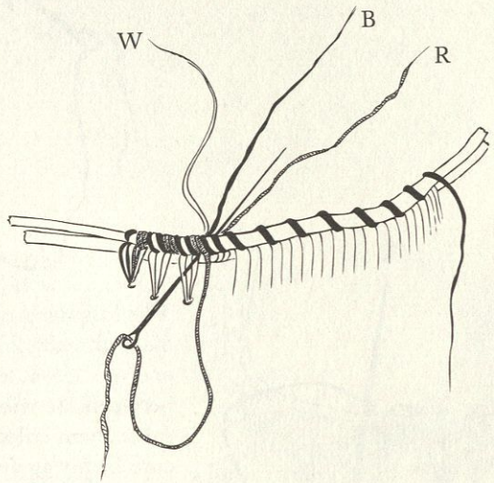
The following option winds the black thread all the way to the end of core A, leaving space in between the windings to wrap the subsequent colors. It secures the core firmly against the primary core. Alternatively, you can wind the black partially across to be only just a few steps ahead of the other colors.

Step 5

Repeat steps 3 and 4 with the black thread until you reach the end of the core. Every time you wrap the core, you will skip five tie-downs and go under the sixth. Pull the thread through gently at each winding so it is snug around the core without crushing it. Let the surplus black thread dangle at the end.



The second option is to work all colors simultaneously along the core. This means working with five double threads and five needles at a time, which can be quite daunting. A combination of the two methods sets up a firm base with the first black thread and then allows you to work with the four other colors: white, black, red, red, across the spine.



Note: If you need to add thread mid-course, go under a tie-down with the remaining thread, then tie the new thread with a weaver's knot as close as possible behind the base of the core. The knot will be hidden under the core when you go under it with the needle.

Step 6

Take the doubled white thread. With the fore edge of the book facing you, loop the thread at the base of the first tie-down with an overhand knot on the inside of the back board. Go in the first hole in the board, from inside to outside, up over the primary core and under core A toward you.

Step 7

Angle the white thread as in Step 3. Catch the tie-down next to the one under which the first diagonal winding of the black thread passed (it's the seventh from the beginning) pivoting the book to work from the spine side.

From now on, you will no longer need to count the tie-downs because each one you catch is next to the tie-down under which you went with the previous color.

Go under core A with the white thread exactly at that spot pushing the needle at a right angle to the core. Come out in front. Leave the white thread lying on the top edge of the text block. The first diagonal winding of the white thread lies along the first diagonal winding of the black thread.

Step 8

Repeat Step 6 with a second (doubled) black thread. Then repeat Step 7, moving one tie-down at a time. Leave the black thread on the top edge of the text block after the diagonal winding.

Step 9

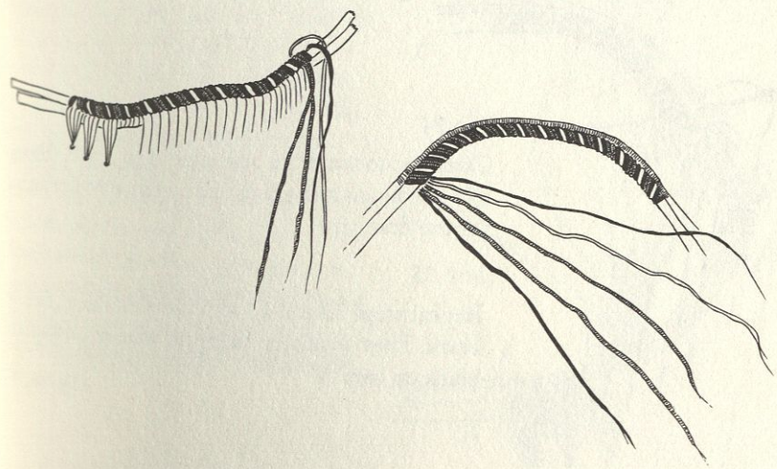
Repeat Step 6 with a (doubled) red thread. Then repeat Step 7, moving one tie-down at a time. Leave the thread on the top edge, next to the others, after the diagonal winding.

Step 10

Repeat Step 6 with another double red thread. Then repeat Step 7, moving one tie-down at a time. Leave the thread on the top edge after the diagonal winding.

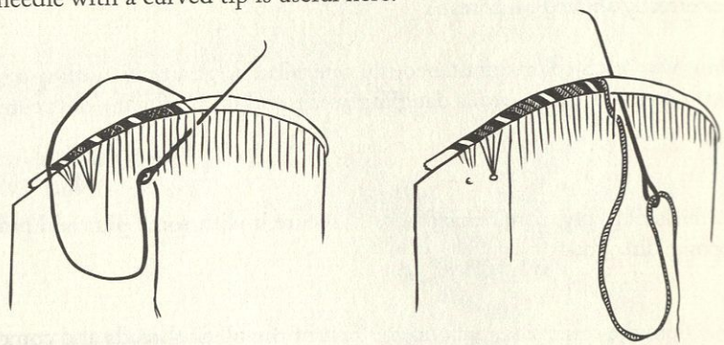
You now have four threads lying on the top edge of the book: one white, one black, two reds. Pick them up in that order and proceed to make another diagonal winding with each color alongside the previous windings. Repeat Steps 7 through 10 with each thread until you reach the end of the core.

Alternate method: If you find it too difficult to work simultaneously with several threaded needles, you can wind each successive color one at a time all the way to the end of the core, as you did in steps 3 and 4 with the black thread, gradually filling the spaces between the windings of the black thread. Although this may seem easier, it presents another challenge, that of picking and going under the correct tie-down to anchor each winding of the other colors. You then leave each thread at the end of the core until you are ready to begin the second core.



The easiest way is to add a third double strand of red thread (anchored to a tie-down) and take it across, alongside the other two windings of red. When you don't need the extra thread, let it hang in the back. Pick it up later by running it under the tie-downs to where you need it. Exit with it between B and C next to the other windings of red.

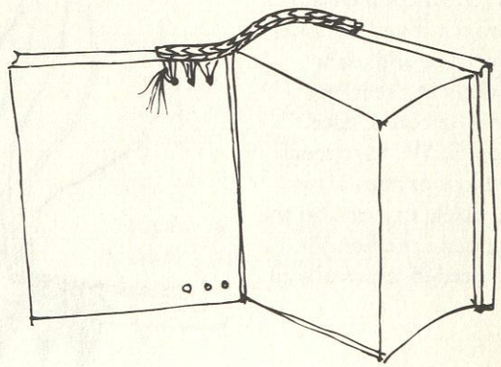
Because the tie-downs are now under more tension it is difficult to catch them on the spine side of the book. You will have to shift the position of the book as you progress to find the best working angle. You may even need to place the book on its side to catch the tie-downs on the boards because they are particularly tight in this area. A needle with a curved tip is useful here.



Step 20

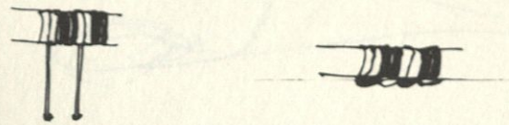
Continue the endband by winding all colors one after the other the same way you worked core A. Note that when you first pick up the red threads, you will have to guide them in between the cores so that each red thread comes out in the right place, facing the last windings of red on core B. Complete the endband with the spine facing you, winding the threads from *left to right*.

At the end, anchor each color to the last possible tie-downs, slide all the threads under the primary endband toward the inside of the board. Cut the surplus thread leaving about 1″ tails and paste down on the board.



6. Endband with a Bead on the Edge

This is the endband most frequently used today. It should be the height of the square less the leather of the headcap so that it supports the leather without causing it to protrude. This type of endband is not usually laced into the boards. Gilissen 1983, Carvin 1988, Szirmai 1999 describe medieval endbands which were the precursors to this common endband.



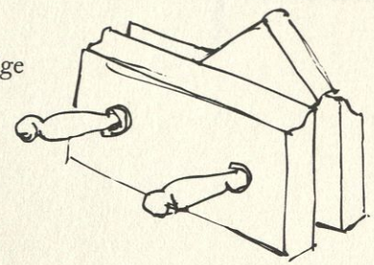
Spine *Edge*

Materials

A core of cord or leather, about 1/16″ in diameter for a small book, up to 1/4″ for a very large one, and slightly longer than the width of the spine
1 or 2 colors of silk or linen thread

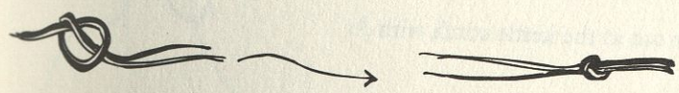
Step 1

Put the book in the press with the edge facing you.



Step 2

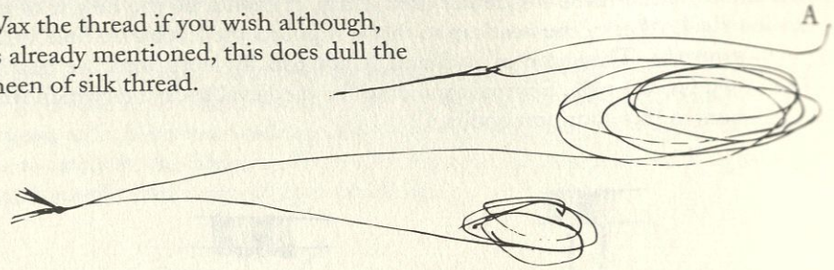
If you are using two colors of thread, tie them together with a simple overhand knot and put a dab of adhesive on it.



Step 3

Thread the tying down thread, A, into a needle.

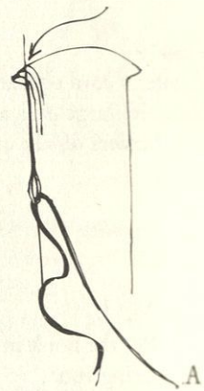
Wax the thread if you wish although, as already mentioned, this does dull the sheen of silk thread.



Step 4

Line up your needle with the first leaf of the book, like this, and go into the center of the gathering it lines up with at the edge of the spine, with the winding thread A.

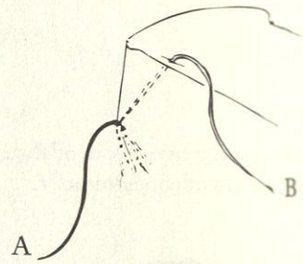
In this case it is the third one due to the backing. Always be sure to start well in from the front and finish well in from the back of the book.



Step 5

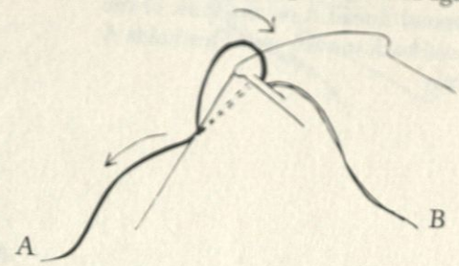
Leave enough thread for the winding end B if you are using one color of thread. Leave the knot in the fold of the gathering if you are using two. See p. 7 for guidelines on length of thread.

Come out at the kettle stitch with A.



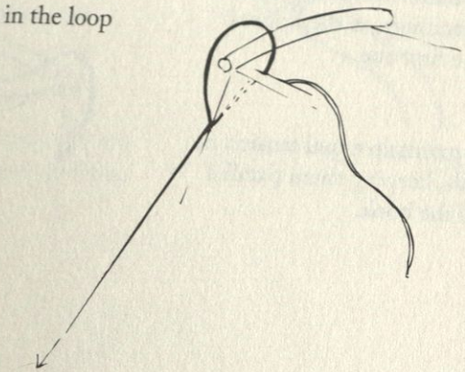
Step 6

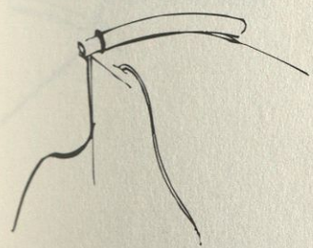
Bring the thread back toward you, go back into the gathering and around again. This forms a loop.



Step 7

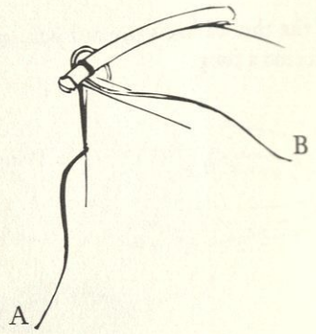
Put the end of the core in the loop and tighten it.





Step 8

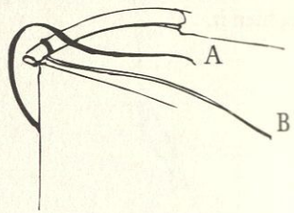
Bring the winding thread, B, under the core, around thread A on the spine of the book, and back toward you. This holds A in place.



Step 9

Bring thread A back over the core. This produces two windings, as the original loop formed the first one.

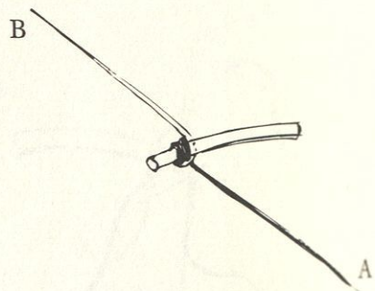
From here on maintain equal tension on the two threads, keeping them parallel to the edge of the book.



Step 10

Bring thread B across thread A and under and behind the core.

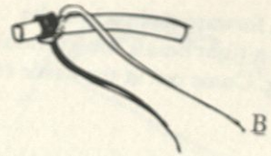
This forms the first bead.



Step 11

Bring thread B back toward you.

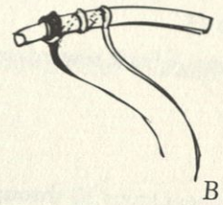
This forms the third winding.



Step 12

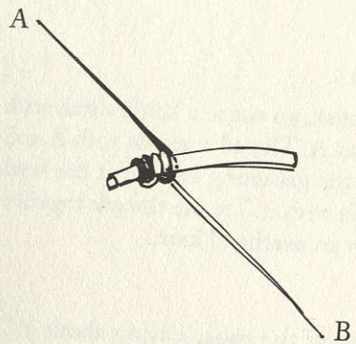
Wind once again, producing two windings with thread B.

Push the threads next to each other so that there is no break, as you go along.



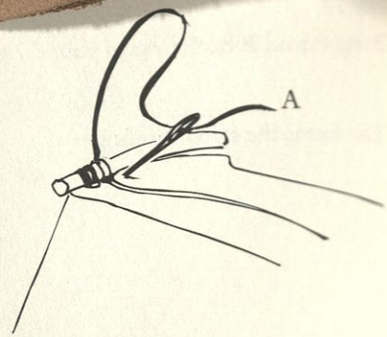
Step 13

Bring thread A across thread B and under the core.



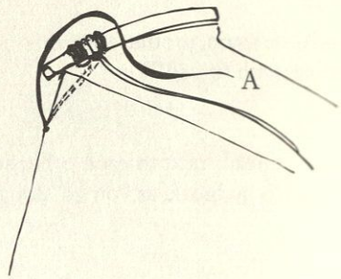
Step 14

Bring A forward and go into the gathering right beside the previous winding. Come out at the kettle stitch.



Step 15

Bring A back toward you.

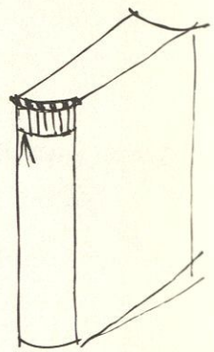


Repeat steps 10 through 15 across the book.

Step 16

To finish, go out at a kettle stitch with thread A. Thread a needle with B and go into the gathering and out at the kettle stitch with it. Tie the threads together with an overhand knot.

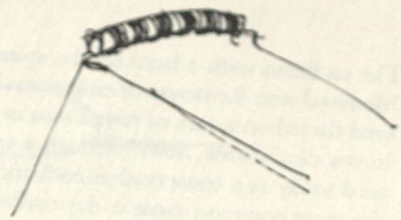
Cut off the ends, leaving about ½″, fray them out, and glue them down.



Step 17

Cut off the extending ends of the core flush with the beginning and ending of the embroidery, being very careful not to cut it.

Put a dab of adhesive on the ends and on the two outer windings on the spine side of the endband.

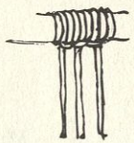


Vary the number of windings of the threads in a two-color endband to produce different patterns.

Adding a different colored thread is described on p. 7.

7. Endband with a Bead on the Spine

The endband with a bead on the spine forms the primary sewing of a great many Medieval and Renaissance endbands. It was usually sewn with unbleached, uncolored thread on a core of tawed skin or vegetable fiber which was laced into a groove in wooden boards. Sewn through a spine lining and laced into a vellum cover, it is used today as a conservation endband. The method of sewing is exactly like that of the most common present-day endbands, the only difference being that the bead is on the spine. For additional research with details and variations see Giuffrida 1981, Clarkson 1982, Gillisen 1983, Szirmai 1999.



Spine

Edge

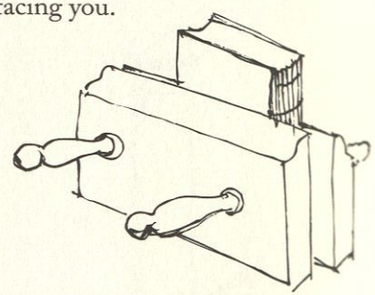
Materials

A core consisting of a strip of leather about 3/8″ to 1/2″ wide by about 5″ longer than the width of the spine, or a piece of stiff cord the same length and about 1/8″ in diameter, or both, with the leather wrapped around the cord

Barbour's 3 cord, No. 30 linen thread

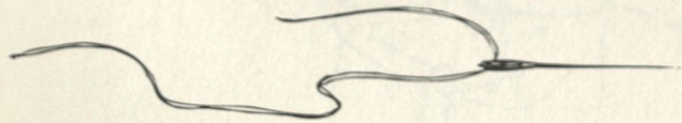
Step 1

Put the book in the press with the spine facing you.



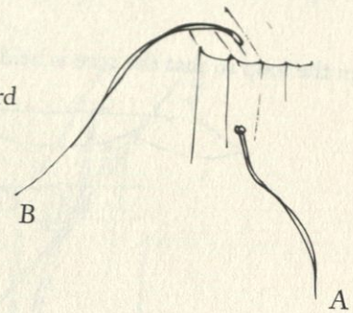
Step 2

Thread a length of Barbour's No. 30 thread into a No. 6 crewel needle. Wax the thread.



Step 3

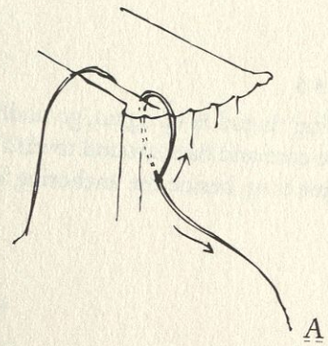
Go inside the fold of the second or third gathering and come out through the kettle stitch.



The winding end, – thread B – can be about one half as long as the tying down end, thread A.

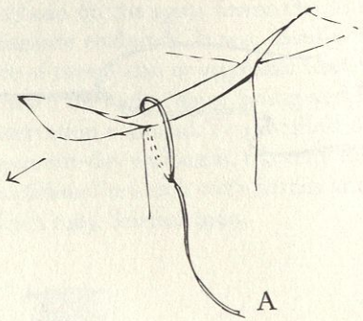
Step 4

Anchoring loop: Bring thread A up, around into the center of the gathering again, and back out at the kettle stitch.

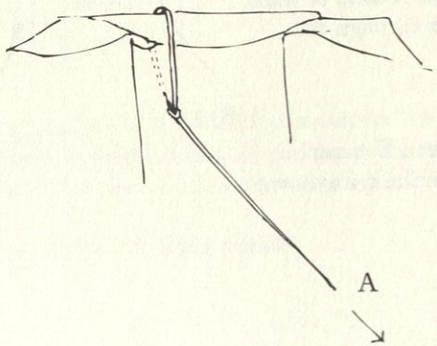


Step 5

Fold the strip of leather and slide it, on the edge of the book, into the loop just formed.

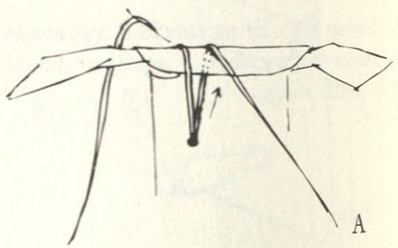


Tighten the loop so that the core is held in place.



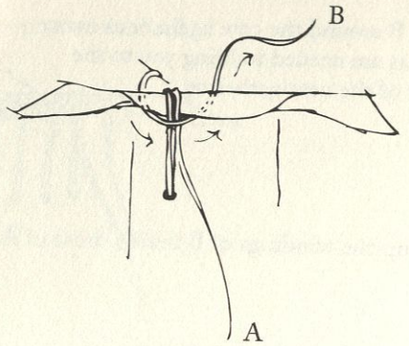
Step 6

Bring thread A up again, go under the core and back around toward you. Line it up beside the anchoring loop.



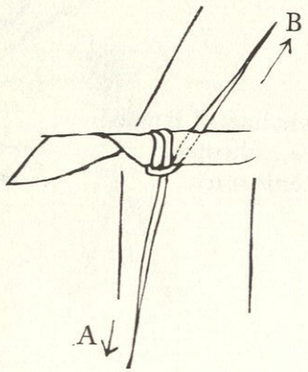
Step 7

Bring B across the two strands of A and go back underneath the core.



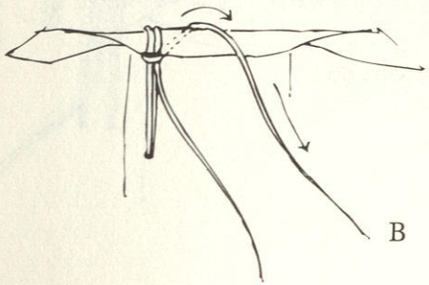
When forming a bead, with the two ends of thread on opposite sides of the core, maintain equal tension on them.

Keep thread A parallel to the spine, and B to the edge.



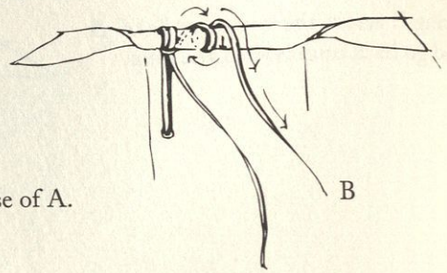
Step 8

Bring B over the core and back toward you.

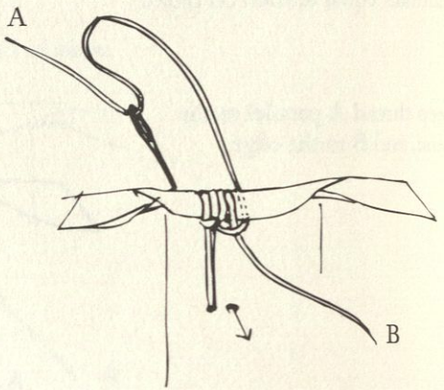


Step 9

Wind B around the core again or as many times as are needed to bring you to the center of the next gathering.



Line up the windings of B beside those of A.

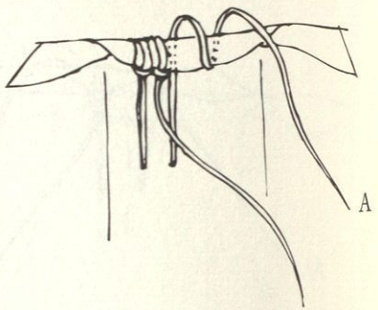


Step 10

Take A across the windings of B and into the center of the gathering, coming out at the kettle stitch.

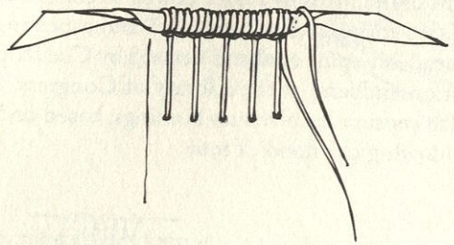
Step 11

Bring A under and around the core and back toward you.



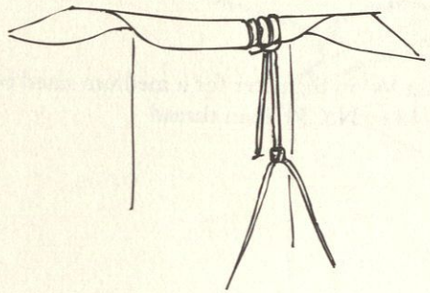
Step 12

Repeat steps 7 through 11 across the spine of the book.

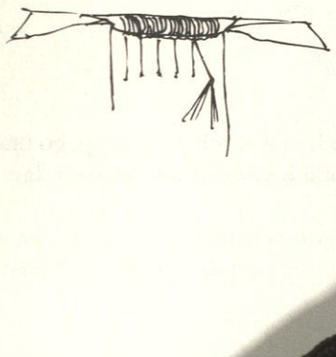


Step 13

Go under the core and inside the last gathering with whichever thread has just formed a bead (You may need to switch the needle). Come out at the kettle stitch and tie the two ends together in a square knot.



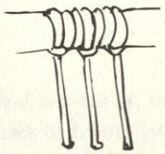
Trim the ends, leaving about 1/2" of thread, and fray them out. Glue them down.



8. Endband with a Bead on the Spine and the Edge

This endband was taught in the 1970s by Roger Powell to conservator Martha Little. A simplified version of this endband using steps 1-5 and repeating 3-4-5 across the spine will produce the bead-on-spine endband devised by Christopher Clarkson that was used as a conservation endband at the Library of Congress. See Clarkson 1982 for his research on XVIth century limp vellum bindings, based on his observations of bindings in Florence following the flood of 1966.

Edge



Spine

Materials

Core of stiff cord about 1/8″ in diameter for a medium sized book
Barbour's 3 cord, No. 18 or No. 30 linen thread

Step 1

Put the book in the press with the edge facing you.

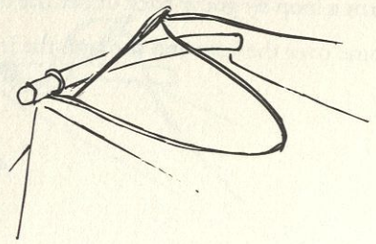
Tie a length of linen thread to the sewing thread inside the first gathering with an overhand knot.

Step 2

Go out on the spine at the kettle stitch. Come up, go under the core toward you and do a full winding around it coming out on the edge.

Step 3

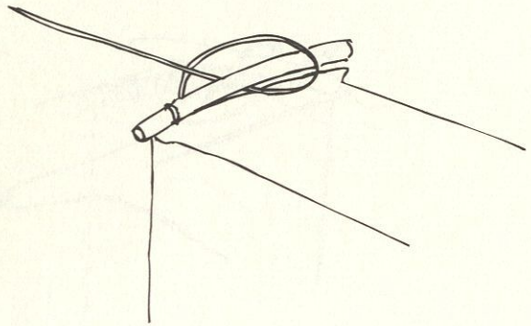
Go into the center of the gathering and out at the kettle stitch to anchor the core firmly.



Step 4

Bring the thread up, twist it and loop it over the end of the core like this.

Slide it on the core snug against the first winding of the thread. Tighten gently.



Step 5

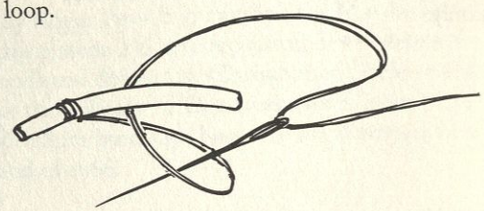
Bring the thread back toward you under the core to the right of the previous winding. This forms a bead on the spine.

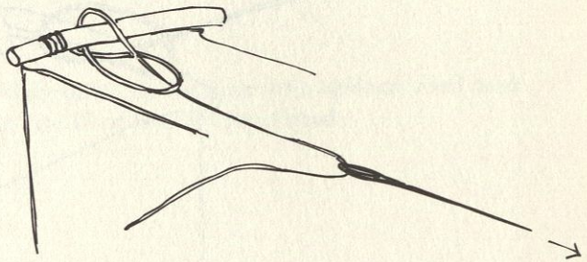
Wind front to back once, or as many times as are needed, to bring you to the center of the next gathering.

Step 6

Form a loop by going back under the core. Note that the threads are crossed.

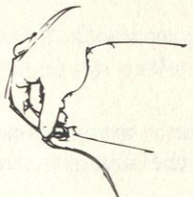
Come over the core and through the loop.





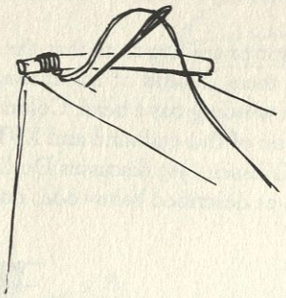
Step 7

Pull the thread tight to form a bead. When it is tight enough push the bead down onto the edge with your thumbnail.



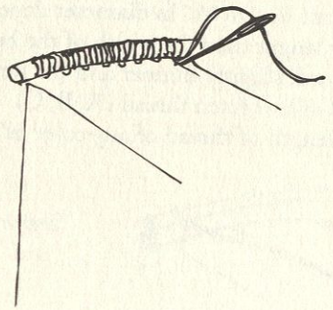
Step 8

Go into the gathering.



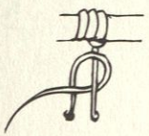
Step 9

Repeat steps 4 through 8 across the book.



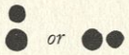
Step 10

End by coming out at the kettle stitch, loop the thread around the previous tie-down, cut off the thread leaving about 1/2", fray out, and glue the ends to the spine.



9. French Double Endband

Distinctive features are the facts that the beads are the same color as the winding threads above them instead of contrasting, as in the endband with a bead on the edge, and each winding has a bead. Colors can be switched at random. For a detailed early description of this endband and XVIIIth century illustrations see Dudin 1761 – reprint 1980. Gilissen 1983 discusses Dudin's comments and believes that the double endband such as described below does not appear before the XVIIth century.



Cross Section

Edge

Spine

Materials

A cord about 1/16″ to 1/8″ in diameter depending on the size of the book and slightly longer than the width of the book
Another cord, slightly thinner and the same length
3 colors of silk or linen thread (A, B, C)
1 shorter length of thread of any color as it will be hidden by the twist (D)

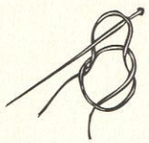
Step 1

Put the book in the press with the edge facing you.

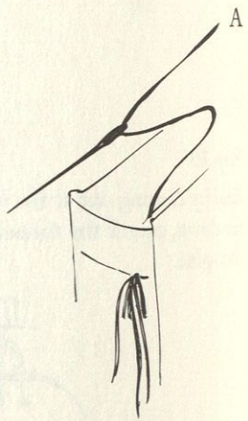
Step 2 - COLOR A

Go into the center of the second or third gathering and out at the kettle stitch with thread A.

Leave a short end of it outside the spine and tie threads B, C, and D to it with a weaver's knot.



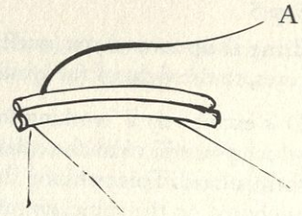
Weaver's Knot



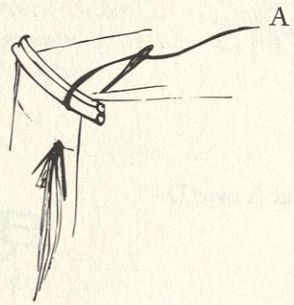
Switch the needle to the long end of A which comes out of the center of the gathering. Thread needles onto B and C.

Step 3

Place two cores on the edge, in front of thread A.

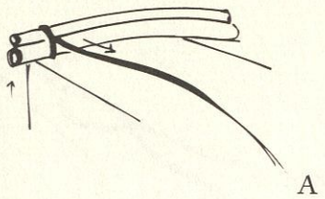


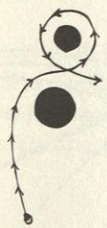
Come back around the two cores, into the gathering, and out at the kettle stitch again. This anchors the cores.



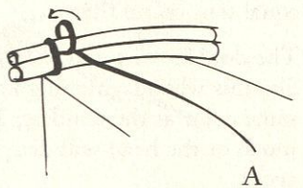
Step 4

With thread A come toward you between the cores, ...



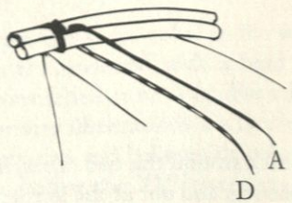


... around the top core, and back between them.



Step 5

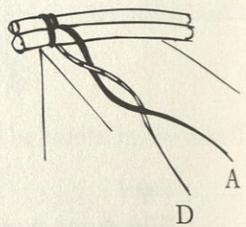
Bring D up toward you, underneath both cores, to the right of the windings of A.



D is exclusively a "working thread" around which you will twist the colored thread to form a bead. This working thread is never anchored on the spine, no matter what color you are in the process of using. In fact D becomes a small front core.

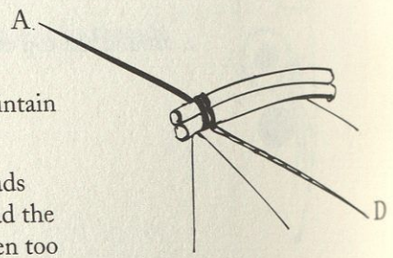
Step 6

Cross D over A and A over D.



Step 7

Go back under both cores with A, thus forming the first bead.



Pull the threads tight, being sure to maintain equal tension on them.

The double twist and holding the threads like this when tightening keeps the bead the same color as the winding. Don't tighten too much or the bead will disappear under the cores.

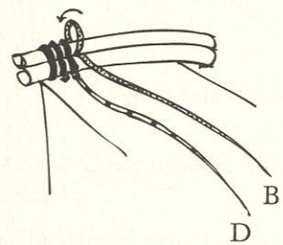
Step 8

Repeat steps 4, 6 and 7 (5 is omitted as D is already in front) as many times as you want windings of A. Tie down after a twist, leaving A dangling from the kettle stitch.

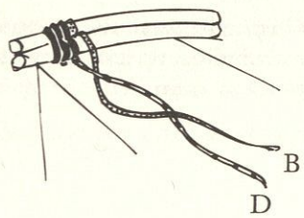
Although tying down can be done in the course of winding a color, it should be done when you have finished winding one, after a twist. This means that you will not necessarily be able to tie down in the center of a gathering.

Step 9 - COLOR B

Bring B up in between the cores, to the right of the latest winding, up around the top core, and in between them again.

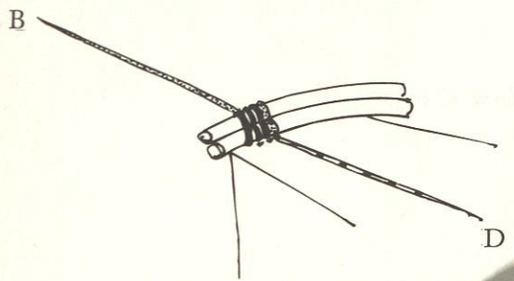


Cross D over B and B over D.



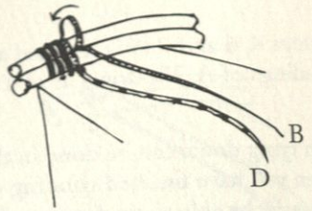
Step 10

Go back underneath both cores with B and tighten the threads, thus forming the first bead in the second color.

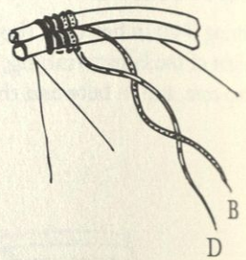


Step 11

Bring B toward you between the cores, around the top one, and back between them, as in step 9.



Cross D over B and B over D.

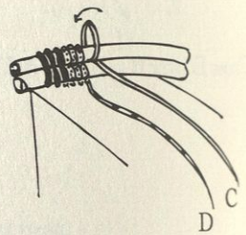


Step 12

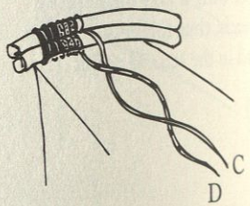
Repeat steps 10 and 11 for as many windings of color B as you wish. Tie down after a twist, leaving B dangling from the kettle stitch.

Step 13 - COLOR C

Bring C up in between the cores, to the right of the latest winding, up around the top core, and in between them again.

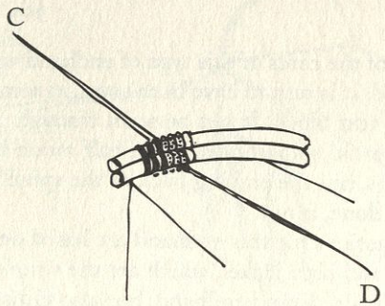


Cross D over C and C over D.



Step 14

Go back underneath both cores with C and tighten the threads, thus forming the first bead of the third color.



Step 15

Repeat steps 13 and 14 for as many windings of color C as you wish. Tie down after a twist, leaving C dangling from the kettle stitch.

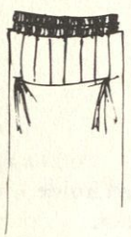
Alternate the colors across the spine at random. The pattern need not be regular or symmetrical.

We have repeated the instructions separately for each color to make it easier to follow them.

Step 16

To finish, tie down with your final color and then go into the gathering with the working thread D. Tie B, C, and D together with an overhand knot and cut off the ends, leaving about ½″. Fray them out and glue them to the spine.

Trim the ends of the cores flush with the embroidery and put a dab of adhesive on the end windings, on the spine side.

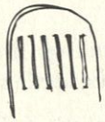


10. Plain Wound Double Endband

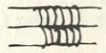
The ends of the cores of this type of endband were usually laced into wooden boards and pegged. It is said to have been sewn, in some cases, as a continuation of the sewing of the text block. It can be sewn through a plain spine lining or one ending in a tab. A partial spine lining and a half moon tab are included in the drawings and instructions, but the angling back of the spine to accommodate the endband, which was often done, is not.

The instructions for this endband are based on the articles and diagrams of Barbara Giuffrida and Karl Jäckel, which are the simplest and best of those published on the medieval, plain wound endband. See also Gilissen 1983, Bibliothèque Nationale 1989, Szirmai 1999.

Cross Section



Spine



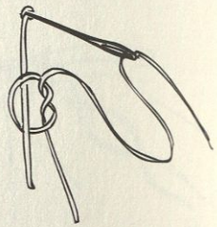
Edge

Materials

2 cores about 1/8″ in diameter for a medium sized book
Barbour's 3 cord, No. 18 linen thread
Leather lining piece with a tab, glued to the spine or the boards, or a spine lining that does not extend

Step 1

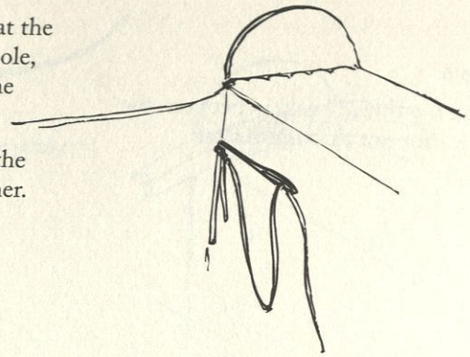
Tie the thread around the sewing thread inside the first gathering with an overhand knot.



Step 2

Pull the thread tight enough so that the knot slides up to the kettle stitch hole, and go out through the hole and the spine lining.

You may find pliers helpful to pull the needle and thread through the leather.

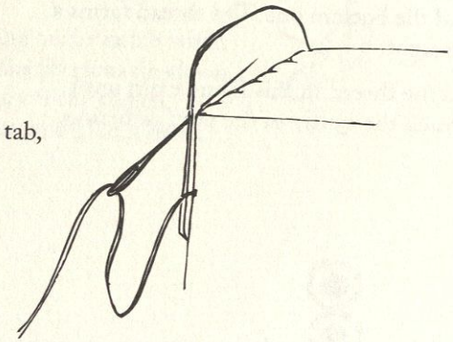


Step 3

Put the book in the press with the edge facing you.

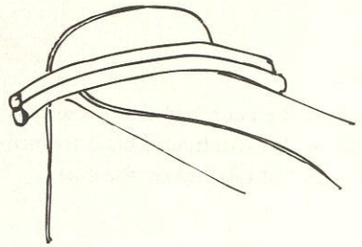
Step 4

Come back toward you through the tab, just below the edge of the book.



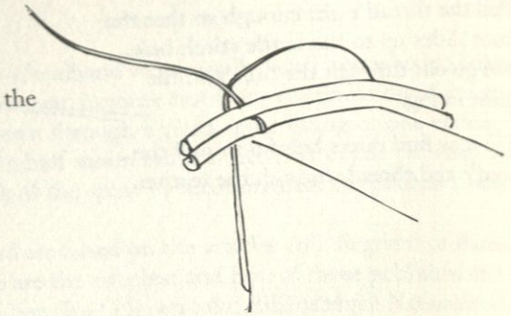
Step 5

Hold the two cores against the tab and on top of the thread.



Step 6

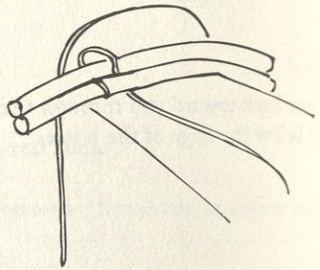
Take the thread back, in between the cores, but not through the tab.

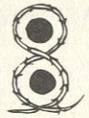


Step 7

Bring the thread around the top core and behind the bottom one. The thread forms a figure eight.

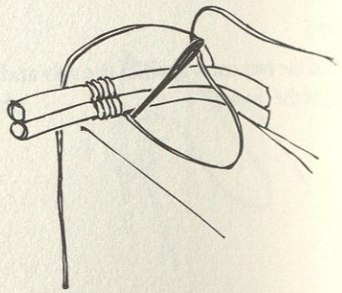
Wind the thread in this figure eight until you reach the center of the next gathering.





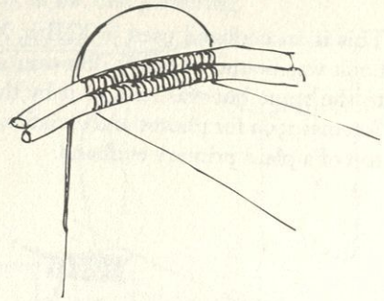
Step 8

Go into the center of the gathering, out at the kettle stitch, and back toward you through the tab, below the cores.



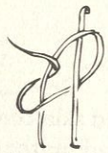
Step 9

Repeat steps 6 through 8 across the spine.

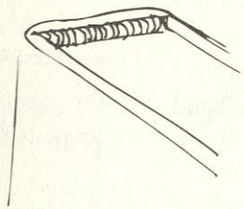


Step 10

Go out of the final gathering at the kettle stitch and tie the thread around the previous tie-down with an overhand knot. Cut off the thread, leaving about ½″, fray it out, and glue it down.



A single, plain wound primary endband can be worked as follows: as in step 5, position one core on top of the thread. Wind the thread in a full circle from front to back and tie it down at regular intervals.



11. Monastic Endband

This is an endband used in XIIIth, XIVth and XVth century monastic binding. A book was bound in heavy skin over wooden boards and the cover was not adhered to the spine but was held to it by the endbands. See Bibliothèque Nationale 1989, Szirmai 1999 for photos and variations on this type of secondary endband worked on top of a plain primary endband.

Spine *Edge*

Materials

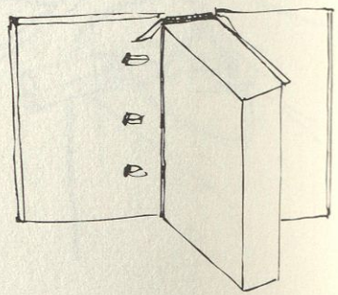
Thin tawed skin core
Plain thread for the primary winding
2 colors of thread, preferably linen, A and B

Step 1

Before covering the book put it in a press or stand it up with the edge facing you.

Step 2

Work a plain wound primary endband on the core (See p. 71). Cover the book and cut the leather flush along the top of the primary endband.



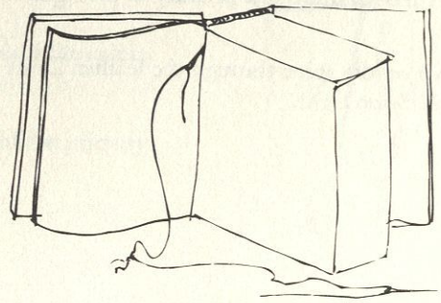
Step 3

Tie threads A and B together with an overhand knot and thread needles onto both of them. Attach them to the sewing of the book in the first gathering.

Step 4

With thread A go out in between the spine and the cover at, or near, the kettle stitch in the first gathering.

Repeat with B.

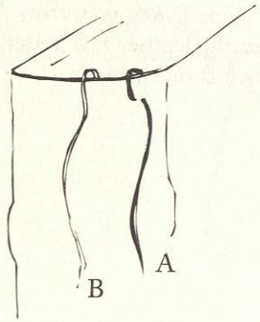


Step 5

Go out through the leather just below the primary endband with A.

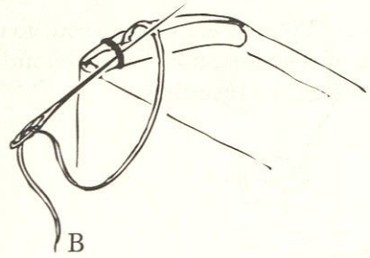
Go around and under the primary, coming out through the spine leather to the right of itself with A.

Tighten the thread gently.



Step 6

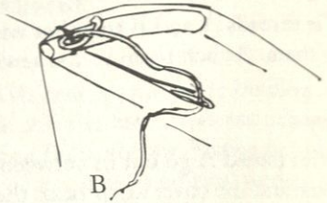
With the edge facing you, go under the winding of A with B from left to right.



Step 7

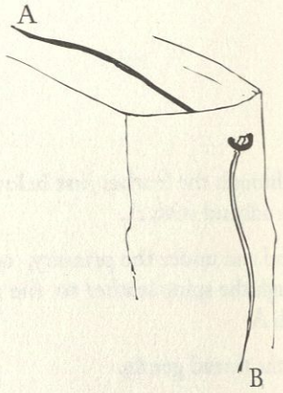
With B go under the primary to the right of A.

Exit on the spine through the leather. Don't pull B too tight.



Step 8

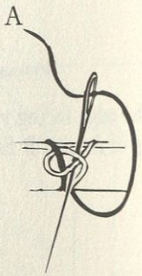
With the spine facing you, cross A over B and go through the leather and under the primary to the left of B on the edge.



Step 9

Loosen B. With the edge facing you, go under the crossing of B with A, from back to front. Tighten B by pulling it on the spine.

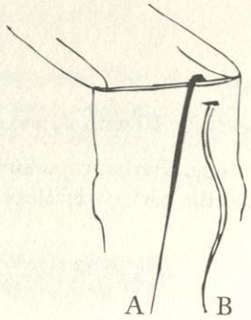
Then tighten A.



Step 10

Cross A back over itself and hold it against the spine.

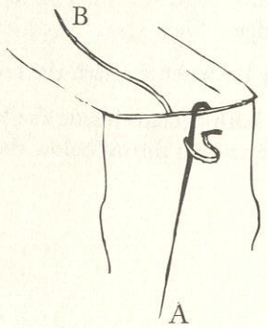
Be sure your crossings sit nicely on top of the primary and the leather.



Step 11

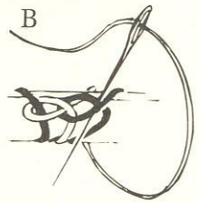
Cross B over A on the spine.

Go through the leather and under the primary.



Step 12

With the edge facing you, go under the crossings of A with B, from back to front.



Step 13

Repeat step 10 with B, and steps 11 and 12 with A.

Continue, alternating colors, across the spine. As usual, the crossings are easier to find as the pattern develops.

Step 14

To finish cross A over B (or B over A) on the spine, and go under the primary to the edge.

Bring B (or A) through the leather and under the primary to the edge.

Take both threads inside the last gathering and glue them into the fold or tie them to the sewing thread below the kettle stitch.

12. Renaissance Chevron Endband

This endband was popular in the XVth and XVIth centuries. This may well have been due to the ease of working it as well as to its handsome appearance. Additional details can be found in Giuffrida 1982, Bibliothèque Nationale 1989. They are described as cross-stitch endbands by Szirmai 1999.

Spine

Edge

Materials

Several strands of silk or linen thread of 2 different colors, A and B
Plain thread for the primary endband
Tawed skin, leather, or vegetable fiber core

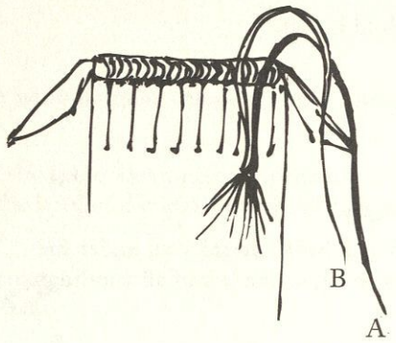
Step 1

Work a plain wound or bead-on-the-spine primary endband.

Step 2

Thread two needles. If you are using fine silk, use several threads per needle, and fewer if you are using thicker linen or cotton thread.

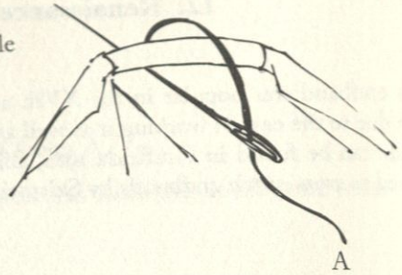
Glue the ends, frayed out, beside each other on the spine. This is preferable to lacing through a fold with knotted multiple strands as they would make an indentation inside a gathering.



Step 3

Wind A from back to front at a right angle to the primary, and exit on the spine.

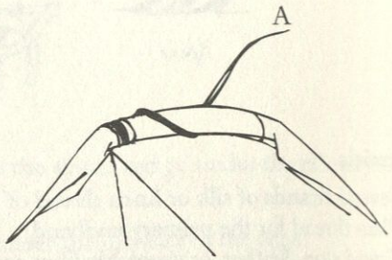
Repeat with B.



Step 4

Come back over the primary and go back under it about 1/4″ ahead with A.

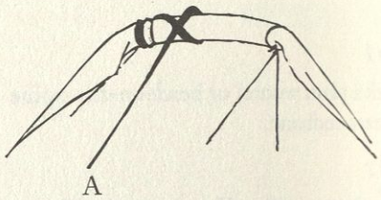
The longer the diagonal, the deeper the chevron. (This endband usually has deep ones.)



Step 5

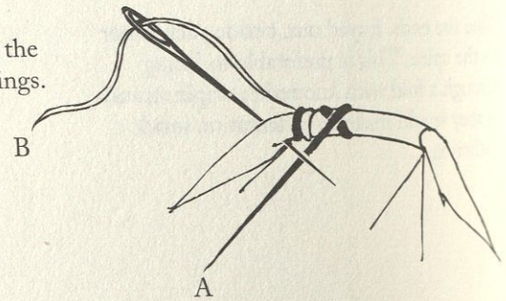
Bring A around over the primary, crossing the first diagonal winding.

Hold it taut.



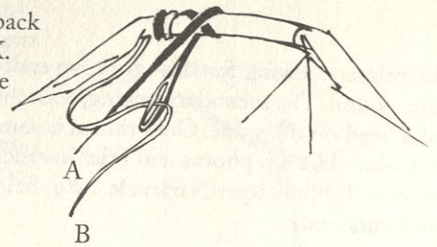
Step 6

Slip B back toward you, under the primary, to the left of all windings.



Step 7

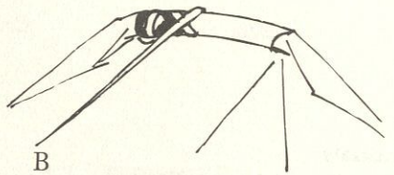
Cross B over A (still held taut) and go back under the primary at the center of the X. That crossing forms the first bead on the edge.



Step 8

Repeat steps 4 and 5 with B, right beside the windings of A.

Only half the X of A will show. This forms the chevron.



Step 9

Repeat step 7 with A.

Continue, alternating colors.

The width of alternate colors may be varied by winding more than once with one of them.

To finish, form a bead and leave the thread on the spine. Go under the primary with the other thread, fray them out at about the level of the kettle stitch, and glue them down.

13. Italian Renaissance Endband

The primary sewing for this attractive endband can be with a bead on the spine or plain wound. The secondary sewing, with three colors, has five cores (four very small) and a bead on the spine. Gold thread is sometimes used for this type of endband.

Color close-up photos and brief instructions for several variant endbands can be found in Bibliothèque Nationale 1989. Szirmai 1999, also discusses similar Renaissance endbands.

Edge

Cross Section

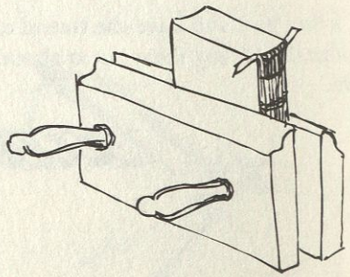
Spine

Materials

A primary endband sewn on a piece of leather and/or cord
Barbour's 3 cord, No. 18 linen thread for the small cores
3 colors of silk or linen thread

Step 1

Put the book in the press with the spine facing you.

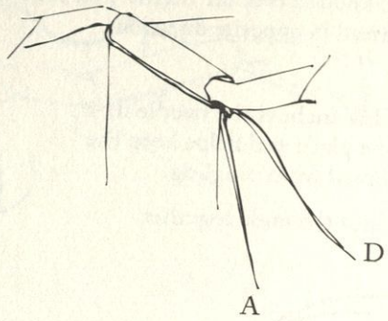


Step 2

Cut a length of thread (Barbour's 3 cord, No. 18 or slightly thicker) about 10″ longer than the width of the spine. Wax it.

Loop it around the primary endband, going under one end of the core and across the spine. Tie it under the other end of the core with a square knot.

This forms cores A and D.

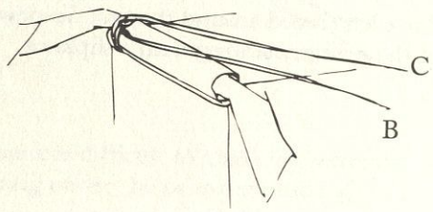


Step 3

Tie another piece of waxed thread, about the same length, around the beginning of the primary endband.

The two ends of this thread form cores B and C.

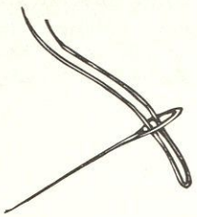
Here only a single overhand knot is needed.



Step 4

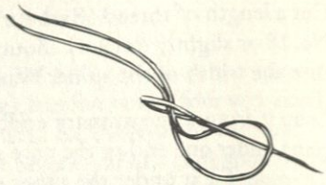
Cut three lengths of thread, each of a different color (in this case let's label them green, white, and red as A, B, and C are already in use), and about 4′ long for a medium size book.

Thread each color into a needle, doubling the thread.



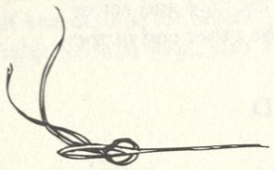
Step 5 (optional)

Bring the loop of the thread opposite the ends to be knotted over the needle. Pull the needle and thread in opposite directions.



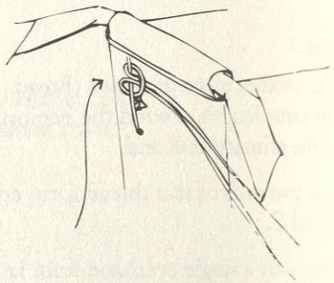
This anchors the needle in one place and helps keep the thread from tangling.

Knot the ends together.



Step 6

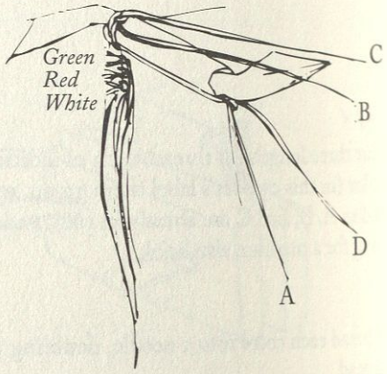
Tie each thread around the first tie-down of the primary sewing with a slipknot.



You now have five cores: the primary endband surrounded by the four small cores A, B, C, and D.

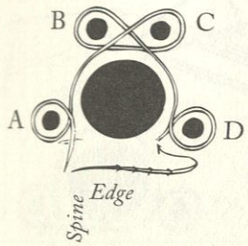
The colored threads are attached and ready to begin sewing.

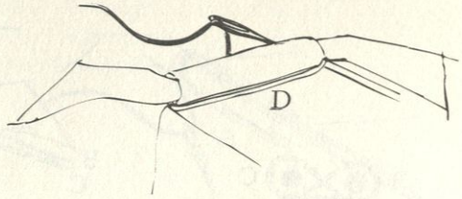
This looks and is confusing at first.



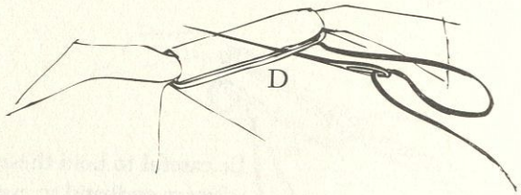
Step 7

Go under the primary endband and cores A and D with the green thread.





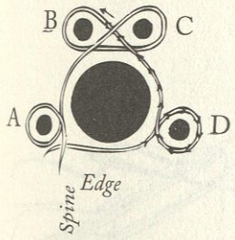
Go back between the primary endband and core D.

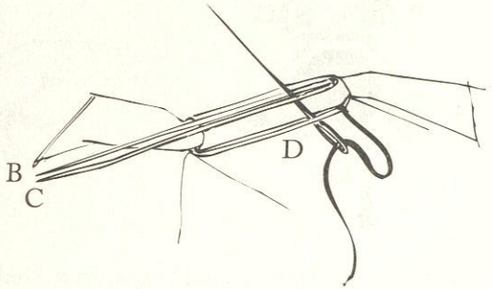


The reason for backtracking here is because it is difficult to angle up between the primary endband and core D when going under the primary endband.

Step 8

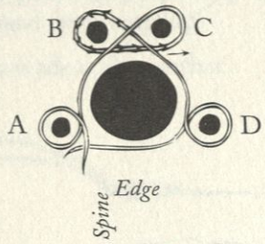
Go around core D and up between cores B and C.

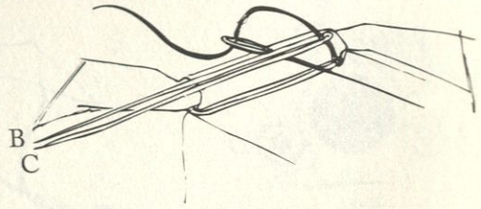




Step 9

Go over core B and under cores B and C.

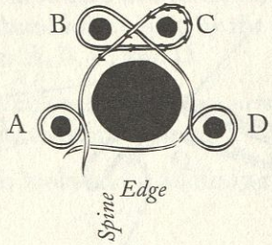


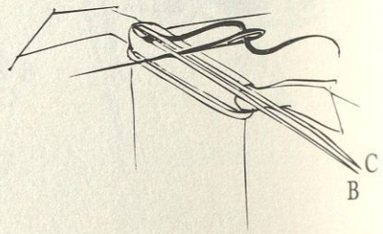


Be careful to hold these cores taut on top of the primary endband to avoid this.

Step 10

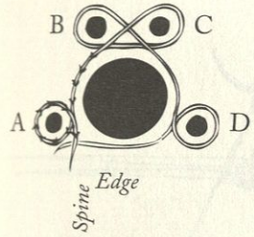
Come back toward you over C and under B.

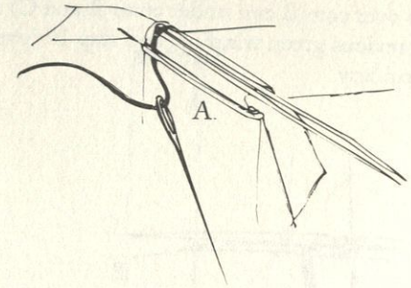


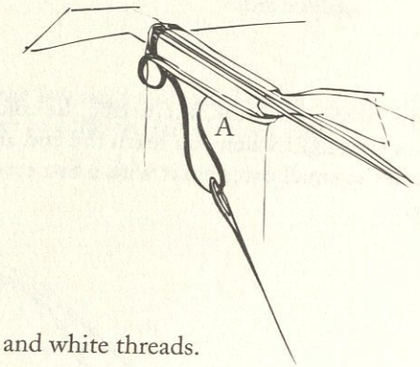


Step 11

Come down along the primary endband and around A, ending where you started.



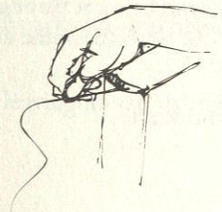




Step 12

Repeat steps 7 through 11 with the red and white threads.

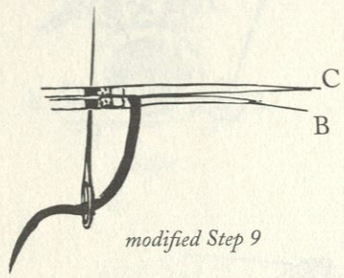
Hold the previous winding tight when starting the journey with the next color.



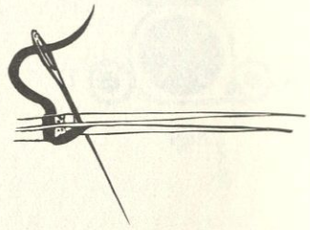
After the three colors are sewn, the chevron on top of the endband can be started.

Step 13

Repeat steps 7 through 11 with the green thread with two exceptions: Do step 9 (go over core B and under cores B and C) *three windings back* in the middle of the previous green winding, and step 10 (over C and under B) to the right of the embroidery.

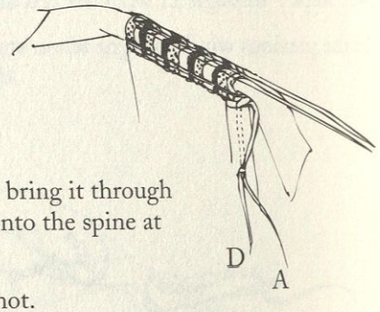


modified Step 9



modified Step 10

Continue across the book, alternating the colors. The embroidery becomes very tight when you reach the end and you may find it helpful to spread the small cores apart with a fine crochet hook to facilitate the sewing.



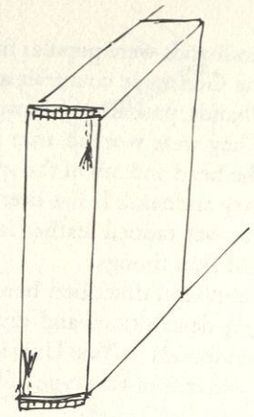
Step 14

To finish, thread core D into a needle and bring it through the center of the final gathering and out onto the spine at the kettle stitch.

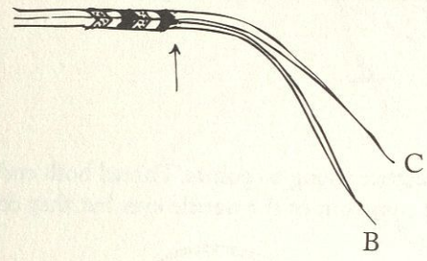
Tie core A to core D with an overhand knot.

Step 15

Cut off the ends, leaving about 1/4˝, and fray them out. Glue core and ends down on the spine.



Cores B and C can be threaded under the last bead and glued down, or cut off flush along the edge of the chevron with a dab of adhesive put on their ends.



If you do not plan to lace the endband into boards, the primary core may also be cut off flush.

Cut off the colored threads, leaving about 1/2˝, fray them out, and glue them to the spine.

14. German Braided Endband

Braided endbands were popular from the late XIVth to the XVIth centuries, particularly in the Germanic countries and the Low Countries. They were worked on primary endbands, probably plain wound or with a bead on the spine, laced into wooden boards. They were worked after the book was covered, with the leather usually cut flush at the head and tail of the spine and the thong going through it and underneath the primary endband. It has been suggested that they were worked wet, but we have found that wet tanned leather is very difficult to braid. We have not tried working with tawed skin thongs.

The endband described here is based on the most difficult of Jäckel's 1975 and Gast's 1983 descriptions and drawings of braided endbands, and on observation of braided endbands in Yale University's Beinecke Library. Gilissen 1983, Szirmai 1999 describe variants of this type of braided endband.

Edge

Spine

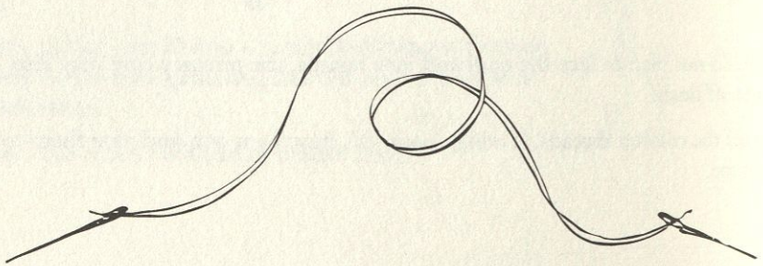
Materials

A long leather thong about 1/8″ wide

A plain wound or beaded-on-the-spine primary endband.

Step 1

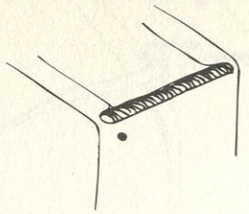
Cut the two ends of the leather thong to points. Thread both ends. It looks as if the ends of the thongs would come out of the needle eyes but they don't.

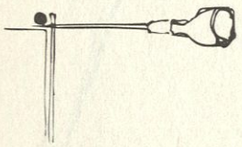


Step 2

Pierce a hole through the leather on the spine with an awl, about 1/8″ in from the joint and just under the primary endband.

Be careful not to damage the bookblock.



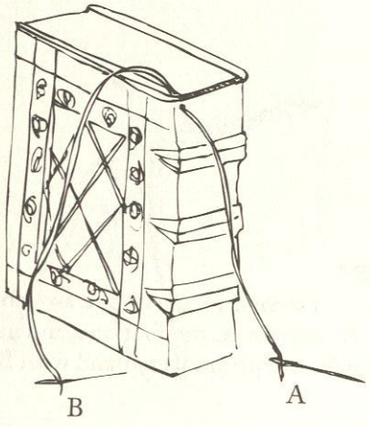


Step 3

With the spine facing you, lace the thong through the hole in the leather and underneath the primary endband.

Ends A and B should be of equal length.

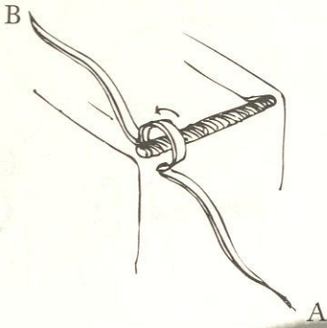
It is helpful to mark end A in ink near the tip.



Step 4

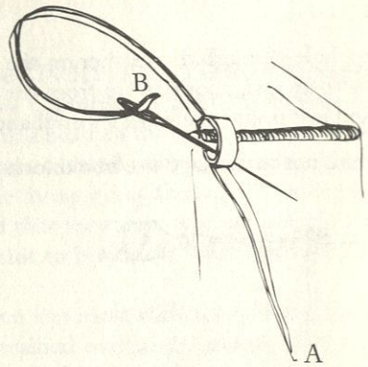
Go around and bring end A toward you through the same hole, using pliers to pull it through.

Tighten the thong about this far.



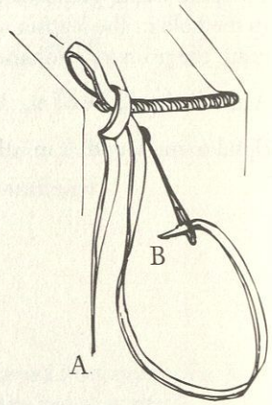
Step 5

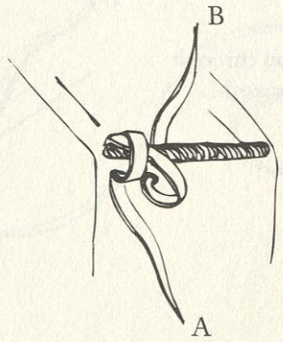
Pull end B through the loop thus formed.



Step 6

Pierce a second hole with the awl, about 3/16″ to 1/4″ away from the first one, and go through it under the primary endband with B.

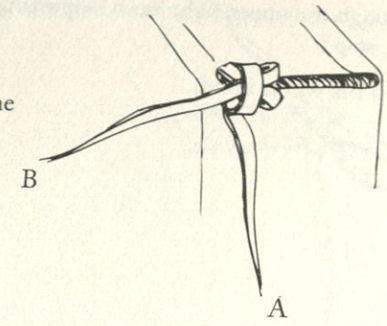




Step 7

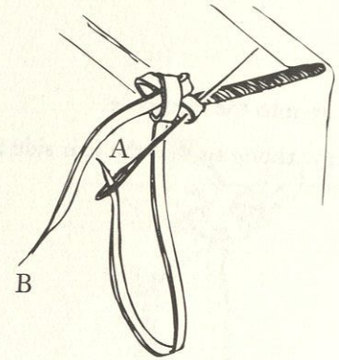
Pull the thong gently (not tight) and go through the top loop with B.

Be sure to have the hair (right) side of the leather showing.



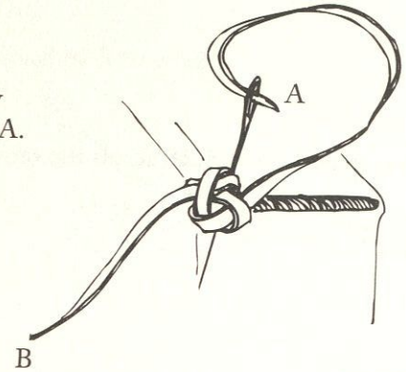
Step 8

Go through the bottom loop with A.



Step 9

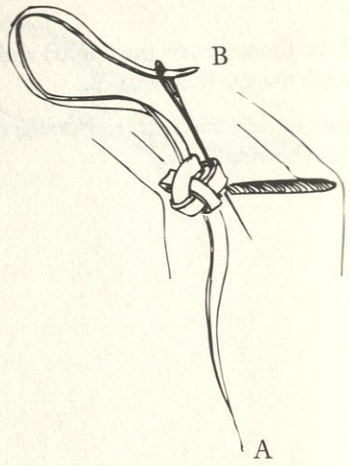
Come back toward you, under the primary endband and through the same hole, with A.



Step 10

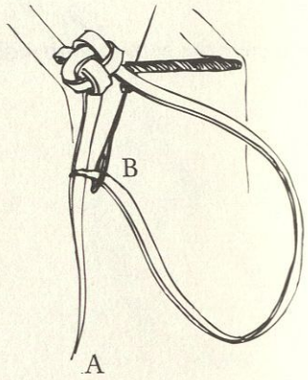
Go through the upper right hand loop with B, as in step 5.

Tighten the whole braid...



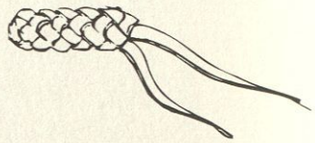
... and go into the next hole.

Twist the thong so that the hair side is showing.



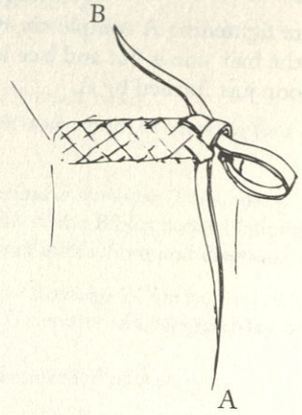
Step 11

Repeat steps 7 through 10 across the spine.

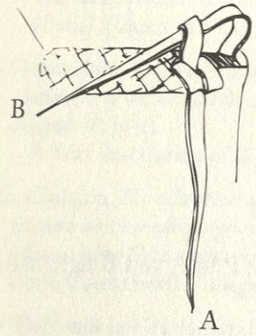


Step 12

The last hole should be just short of the joint.

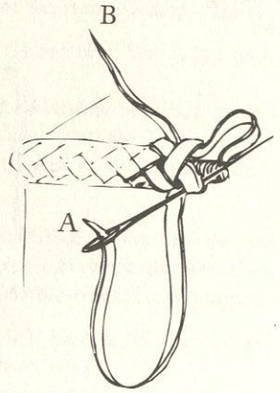


Bring B through the last upper loop.

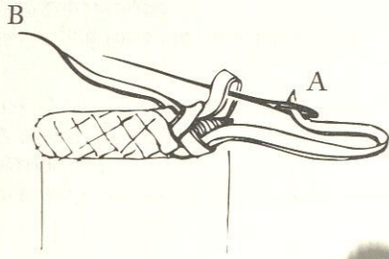


Step 13

Go through the bottom loop with A ...

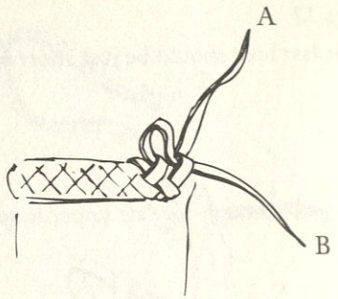


... and come back through the last loop formed by B (step 12).



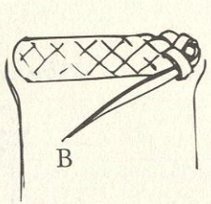
Step 14

Before tightening A completely, twist B so that the hair side is out and lace it through the loop just formed by A.



Step 15

One last lacing with B rounds off the endband nicely. Pull A and B tight and cut them flush.



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Middleton, Bernard C., *A History of English Craft Bookbinding Technique* (New York and London, 1963); fourth expanded and revised edition: The British Library and Oak Knoll Press (1996, 2000).
An outline of the history of English endbands.

—— *The Restoration of Leather Bindings,* Rev. ed. (Chicago, 1984).
Dating of a few endbands, with drawings.

Petersen, Theodore C., "Early Islamic Bookbindings and their Coptic Relations", *Ars Orientalis* 1 (1954) pp. 41–64.
Includes two drawings of a Coptic endband. There are also clear drawings and a description of the Coptic method of endbanding in Petersen's unpublished work in The Morgan Library & Museum in New York, *Coptic Bookbindings in the Pierpont Morgan Library* [1950?].

Pollard, Graham, "The Construction of English Twelfth Century Bindings", *The Library* 5:17 (1962) pp. 1–22.
Diagram and description of XIIth century double endband sewing.

—— "Some Anglo-Saxon Bookbindings", *The Book Collector* 24 (1975) pp. 130–159.
Diagrams of the board attachment (including endbands which were part of it) and descriptions of books dating from the VIIIth to the XIIth centuries.

Powell, Roger and Peter Waters, "Technical Description of the Binding", in *The Stonyhurst Gospel of Saint John,* edited by T. Julian Brown (Oxford: University Press for the Roxburghe Club, 1969) pp. 45–55.
A detailed, clear description of the Stonyhurst Gospel endband.

Regemorter, Berthe van, "La reliure arménienne", *Bazmaveb* 61 (1953) pp. 200–204.
Description of Armenian endbands.

——— "La reliure byzantine", *Revue Belge d'Archéologie et d'Histoire de l'Art 36* (1967) pp. 99–142.
Brief description of Greek endbands with good photographs.

——— "La reliure des manuscrits grecs", *Scriptorium* 8 (1954) pp. 3–23.
Fairly detailed descriptions of Greek endbands.

——— "Le codex relié depuis son origine jusqu'au Haut Moyen Age", *Le Moyen Age* 61 (1955) pp. 1–26.
Brief descriptions of the Stonyhurst Gospel and Cadmug Codex endbands.

——— "Note sur l'emploi des fils métalliques dans la tranchefile", *Scriptorium 15* (1961) pp. 327–328.
Byzantine influence on XVth and XVIth century Greek manuscripts and the use of metallic thread in the Victor Codex endband.

——— *Binding Structures of the Middle Ages: A Selection of Studies by Berthe van Regemorter* (Brussels, 1992). New Castle: Oak Knoll Press, 2017
BvR's most important articles translated and annotated by Jane Greenfield.

Roberts, Matt T. and Don Etherington, *Bookbinding and the Conservation of Books, A Dictionary of Descriptive Terminology* (Washington, 1982).
Summarizes the history of endbands and lists the materials used.

Scheper, Karin, *The Technique of Islamic Bookbinding: Methods, Materials and Regional Varieties* (Leiden, 2015).
First monograph dedicated to the technical development of the bookbinding tradition in the Islamic world. Various sewing techniques are described in great detail.

Szirmai, J.A., *The Archaeology of Medieval Bookbinding* (Aldershot, UK, 1999).
Detailed and comprehensive descriptions of medieval bookbinding techniques and structures, including endbands, from across Europe and the Mediterranean regions.

Town, Lawrence, *Bookbinding by hand, for students and craftsmen* (New York, 1950).
Brief instructions on working an endband with a bead on the edge.

Vézin, Jean, "La réalisation matérielle des manuscrits latins pendant le haut Moyen Age", *Codicologia* 2 (Leiden, 1978) pp. 15–51.
A clear diagram of a plain, wound, double endband which is an extension of the sewing of the textblock.

Young, Laura S., *Bookbinding & Conservation by Hand* (New York and London, 1981). Reprinted (New Castle: Oak Knoll Press, 2012).
Specifies the materials needed and gives instructions on working single core endbands, double core endbands, German style endbands, and endbands worked with the sewing of the textblock.

Online Resources

Many libraries have now digitized their collections of manuscripts and rare books, including their bindings. The digitization of library holdings will no doubt continue to expand in the future. The images that are available are usually high resolution and can be zoomed into for very close inspection, although endbands are not always visible in images of bindings. Below is a small sampling of resources that are currently (2016–2017) available online.

Bibliothèque Nationale de France:
http://reliures.bnf.fr/reliures
http://reliures.bnf.fr/

Bibliothèque virtuelle des manuscrits médievaux (Institut de recherche et d'histoire des textes):
http://bvmm.irht.cnrs.fr/
http://www.irht.cnrs.fr/fr/ressources/les-ressources-electroniques

British Library:
https://www.bl.uk/manuscripts/About.aspx

Center for the Study of New Testament Manuscripts:
http://csntm.org/Library

Heidelberg University Library:
http://www.ub.uni-heidelberg.de/Englisch/helios/digi/handschriften.html

Medieval Manuscripts Online:
http://www.utm.edu/staff/bobp/vlibrary/mdmss.shtml

Monastic Manuscript Project:
http://www.earlymedievalmonasticism.org/listoflinks.html#Digital

National Library of Wales:
https://www.llgc.org.uk/discover/digital-gallery/manuscripts/

New York Public Library:
https://digitalcollections.nypl.org/search/index?utf8=%E2%9C%93&keywords=bindings#

University of Chicago:
http://goodspeed.lib.uchicago.edu/

Walters Art Museum:
http://www.thedigitalwalters.org/01_ACCESS_WALTERS_MANUSCRIPTS.html

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Endbands from East to West

How To Work Them

Jane Greenfield and Jenny Hille

Third Edition of *Headbands: How to Work Them*

Revised by Jenny Hille

"Since it was first published in 1986, Jane Greenfield and Jenny Hille's book on endbands has been for me and most, if not all, book conservators and bookbinders the foundation of our knowledge of endbands, of how to distinguish them and how to make them. ... The basic distinction between endbands found in Western bindings and those found in Eastern bindings which appears in this third edition of the book is both helpful and meaningful, and certainly indicative of this realization that endbands, like all artifacts, present variations according to the time, place and cultural context in which they have been made."

—from the Foreword to the third edition by Georgios Boudalis

Most manuals on bookbinding tend to provide an outline of the basic bookbinding techniques, but do little to provide detailed information on specific aspects of the craft. A topic often overlooked is how to create endbands (also called "headbands"), those structural and decorative bands made of plain linen or hemp, silk or cotton thread, that one can see at the head and tail of the spine of a book.

This manual, written by two experienced book conservators, is an easy to use, step-by-step guide showing how to create fourteen different types of historical endbands. Separate chapters are devoted to each, with all the necessary materials listed at the beginning. Among the examples are Coptic, Ethiopian, Islamic, Greek, Armenian, French, Monastic, Renaissance, Italian, German, and modern styles.

Each step is clearly illustrated and all the instructions have been tried out on students of the craft and perfected at the bench so that the easiest and simplest method is presented. Written for both beginners and experienced binders, *Endbands* has established itself as one of the classic manuals for book conservators and hand bookbinders.

From reviews of the earlier editions:

"Clear, direct, and filled with wonderful diagrams, taking one through the winding, twisting, beautiful patterning process as through an exciting adventure-filled maze."

—Paula Gourley, The Guild of Book Workers Newsletter, December 1992

Front cover photo: 16th century Armenian illuminated manuscript in a traditional calf binding with 17th century enameled silver plaques from Kayseri, courtesy The Morgan Library & Museum (MS M.437).

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